Standardization

News Magazine of the American Standards Association, Incorporated

Photography — popular, exact science for amateurs and experts **(see page 168)**

JULY 1950

American Standards Association

Incorporated

Officers

THOMAS D. JOLLY, President
H. S. OSBORNE, Vice-President
HOWARD COONLEY, Chairman, Executive Committee

VICE ADMIRAL G. F. HUSSEY, JR, USN (Ret), Managing Director and Secretary
CYRIL AINSWORTH, Technical Director and Asst Secretary

Consultant—P. G. AGNEW

Board of Directors

DONALD ARMSTRONG, President, U. S. Pipe & Foundry Co—Cast Iron Pipe Research Assn
WILLIAM L. BATT, President, SKF Industries, Inc—Amer Soc of Mech Engrs
ROBERT I. CATLIN, Vice-President, Aetna Casualty and Surety Co—Nat Safety Council
ARDENIA CHAPMAN, Dean, College of Home Economics, Drexel Institute of Technology—Member-at-Large
RICHARD A. COLGAN, JR, Exec Vice-President, Nat Lumber Mfrs Assn—Nat Lumber Mfrs Assn
*HOWARD COONLEY, Director, Walworth Co—Mfrs Stdzn Soc of the Valve & Fittings Industry
LESTER S. COREY, President & General Manager, Utah Construction Co—Member-at-Large
E.H. EACKER, President, Boston Consolidated Gas Co—Amer Gas Assn
*R.E. GAY, President, Bristol Brass Corp—Copper and Brass Research Assn
*THOMAS D. JOLLY, Vice-President, Aluminum Co. of America—President, ASA
R. OAKLEY KENNEDY, Formerly Vice-President, Cluett, Peabody and Co, Inc—Member-at-Large
*FREDERICK R. LACK, Vice-President, Western Elec Co, Inc—Past President, ASA
J.H. McELHINNEY, Vice-President, Wheeling Steel Corp—Amer Iron & Steel Inst
HOWARD H. MORGAN, Vice-President and Chief Engr, Robert W. Hunt Co—Amer Soc for Testing Materials
C. E. OLMSTED, Vice-President, The Texas Co—Amer Petroleum Inst
*H.S. OSBORNE, Chief Engr, Amer Tel & Tel Co—Vice-President, ASA
E. E. POTTER, Vice-President, General Electric Co—Nat Elec Mfrs Assn
MAURICE STANLEY, Chairman of Board, Fafnir Bearing Co, Anti-Friction Bearing Manufacturers Assn, Inc
J. C. VINCENT, Executive Vice-President, Packard Motor Car Co, Automobile Manufacturers Assn
B. S. VOORHEES, Vice-President, New York Central System, Assn of American Railroads
W. C. WAGNER, Exec Dept, Philadelphia Elec Co—Chairman, ASA Standards Council
*Members of the Executive Committee

Standards Council

W. C. WAGNER, Exec Dept, Philadelphia Elec Co, Chairman
J. R. TOWNSEND, Bell Tel Labs, Vice-Chairman

Chairmen of Correlating Committees

BUILDING—Theodore I. Cos, Technical Secretary, Amer Inst of Architects, Dept of Education and Research, Washington, D. C.
CHEMICAL INDUSTRY CORRELATING COMMITTEE—J. G. Henderson
CONSUMER—Alfred C. Thompson, General Manager, Miller and Rhoads, Inc, Richmond, Virginia
ELECTRICAL—C. R. Harte, Connecticut Company, New Haven, Conn.
HIGHWAY—S. J. Williams, Asst to Pres, Nat Safety Council, Chicago, Ill.
MECHANICAL—F. T. Ward, Wilton, Conn.
MINING—Lucian Eaton, Consulting Engineer, Milton, Massachusetts
MISCELLANEOUS PROJECTS CORRELATING COMMITTEE—G. H. Herndon
PHOTOGRAPHIC—Paul Arnold, Ansco, Binghamton, N. Y.
SAFETY—Harold L. Miner, Manager, Safety and Fire Protection Division, E. I. duPont de Nemours & Company, Inc, Wilmington, Delaware

ASA Member-Bodies

Air Conditioning & Refrigerating Machinery Assn
Aluminum Assn
Amer Gas Assn
Amer Home Economics Assn
Amer Inst of Chemical Engineers
Amer Inst of Elec Engrs
Amer Inst of Steel Construction, Inc
Amer Iron & Steel Inst
Amer Ladder Inst
Amer Petroleum Inst
Amer Soc of Civil Engrs
Amer Soc of Mech Engrs
Amer Soc for Testing Materials
Amer Soc of Tool Engrs, Inc
Amer Water Works Assn
Anti-Friction Bearing Mfrs Assn, Inc
Associated Gen Contractors of Amer, Inc
Assn of Amer Railroads
Assn of Casualty and Surety Cos, Accident Prevention Dept
Automobile Mfrs Assn
Business Forms Inst
Cast Iron Pipe Research Assn
Conveyor Equipment Mfrs Assn
Copper & Brass Research Assn
Elec Light and Power Group:
Assn of Edison Illum Cos
Edison Elec Inst
Fire Protection Group:
Associated Factory Mutual Fire Ins Cos
Nat Bd of Fire Underwriters
Nat Fire Protection Assn
Underwriters' Labs, Inc
Gas Appliance Mfrs Assn
Grinding Wheel Inst
Gypsum Assn
Heating, Piping and Air Conditioning Contractors Nat Assn
Industrial Fasteners Institute
Inst of Radio Engrs
Limited Price Variety Stores Assn Inc
Mfrs Stdzn Soc of the Valve and Fittings Industry
Metal Cutting Tool Inst
Motion Picture Research Council, Inc
Nat Aircraft Stds Com
Nat Assn of Hosiery Mfrs
Nat Assn of Mutual Casualty Cos
Nat Assn of Purchasing Agents
National Coal Assn
Nat Elec Mfrs Assn
Nat Lumber Mfrs Assn
Nat Machine Tool Builders' Assn
Nat Office Management Assn
Nat Retail Dry Goods Assn
Nat Safety Council
Outdoor Advertising Assn of Amer, Inc
Oxychloride Cement Assn
Photographic Mfrs Group:
Ansco Div of Gen Aniline & Film Corp
Eastman Kodak Co
Portland Cement Assn
Radio Mfrs Assn
Refrigeration Equipment Mfrs Assn
Screw Industry Stds Com:
Machine Screw Nut Bur
Sheet Metal Screw Statistical Service
U.S. Cap Screw Service Bur
U.S. Machine Screw Service Bur
U.S. Wood Screw Service Bur
Soc of Automotive Engrs, Inc
Soc of Motion Picture and Television Engrs
Structural Clay Products Inst
Telephone Group:
Bell Tel System
U.S. Independent Tel Assn

Associate Members

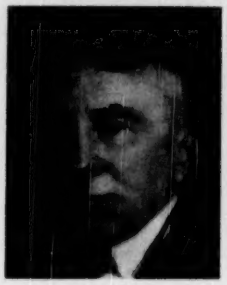
Acoustical Soc of Amer
Amer Assn of Textile Chemists and Colorists
Amer Gear Mfrs Assn
Amer Hotel Assn
Amer Inst of Architects
Amer Inst of Laundering
Amer Soc of Bakery Engineers
Amer Soc of Heating & Ventilating Engrs
Amer Soc of Lubrication Engrs
Amer Soc of Refrigerating Engrs
Amer Trucking Assn, Inc
Amer Welding Soc
Assn of Consulting Management Engrs, Inc
Assn of Iron and Steel Engrs
Certified Ballast Manufacturers
Compressed Gas Assn, Inc
Douglas Fir Plywood Assn
Heat Exchange Inst
Illuminating Eng Soc
Industrial Safety Equip. Assn
Instrument Soc of America
Insulation Board Inst
Internat Acetylene Assn
Marble Inst of Amer
Metal Lath Mfrs Assn
Metal Window Inst
Nat Assn of Finishers of Textile Fabrics
Nat Assn of Wool Mfrs
Nat Elevator Mfg Industry, Inc
Nat Federation of Textiles, Inc
Nat Lime Assn
Nat Screw Machine Products Assn
Photographic Soc of Amer, Inc
Red Cedar Shingle Bur
Scientific Apparatus Makers Assn
Textile Color Card Assn of the U.S., Inc
Textile Distributors Inst, Inc
Veneer Assn

Company Members—More than 1900 companies hold membership either directly or by group arrangement through their respective trade associations.

Marginal Notes

Charles Rufus Harte—

Among those who hold a record for length and quality of service in standardization (see page 165) is ASA's beloved "elder statesman"—Charles Rufus Harte. His salty humor and keen analysis of a technical or procedural problem have frequently enlivened a difficult meeting and pulled a committee out of the doldrums.



Much of the responsibility for ASA's effective electrical program can be credited to his work as chairman of the Electrical Standards Committee since its earliest organization in 1926. His leadership as a member of the Standards Council, and its predecessor, the "Main Committee," has been continuous since the early 1920's on behalf of the American Engineering Railway Association, the American Transit Association, and very recently the American Institute of Electrical Engineers. His chairmanship of the "Enlarged Rules Committee' steered the original American Engineering Standards Committee into reorganization as the American Standards Association in 1929.

Since 1893, when Mr Harte started his career as chairman and assistant engineer by helping eliminate grade crossings for the New York New Haven and Hartford Railroad up to his present job with the Connecticut Company, his primary interest, aside from standardization, has been electric railways.

He is also an authority on early canals and early American iron and steel works.

One of the hobbies which gives his friends most amusement is his passion for ancient tombstones. His collection of pictures of unusual epitaphs can be relied on for an apt quotation and a laugh in many a difficult situation.

No Echoes Here—

This anechoic chamber at Harvard University, designed by Dr Leo Beranek (see page 170) and H. P. Sleeper, Jr., is so completely silent that even a heartbeat makes a startling racket. The 29 x 29 x 41 ft

soundproof and echoproof room makes possible careful control of the sound used in tests to check on the performance of microphones and earphones.

Our Front Cover

Photography, still a relatively young science, is constantly pushing its boundaries to exciting, new limits. Daily, thousands of travelers and hurried New York commuters passing through Grand Central Station stop to look at the huge Colorama (60 ft long, 18 ft high) that extends accross one end of the station—a series of three full-color giant transparencies. The center picture is reproduced on our cover from a black and white print that was taken from the Ektacolor negative used in the Colorama. The degree of enlargement in the display transparencies is approximately 44 diameters (enough to make the heads about four ft high). See page 168 of this issue for another photographic story of interest to all amateur photographers.

Opinions expressed by authors in STANDARDIZATION *are not necessarily those of the American Standards Association.*

Vol. 21 No. 7 **Standardization** **July 1950**

Formerly Industrial Standardization

Published Monthly by AMERICAN STANDARDS ASSOCIATION INCORPORATED 70 E. 45th St., N. Y. 17

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

In This Issue

Featured—

Council's Work Applauded as Public Service. *By T. D. Jolly*.... 165
Standards Council Members Who Received Awards..... 165
Council Plays "Watchdog"—Democratic Methods at Stake. *By F. M. Farmer*..... 166
A World-Wide Guide to Film Exposure. *By M. G. Anderson*..... 168
How Well Does an Earphone Work? *By Dr. Leo L. Beranek*..... 170
Miscellaneous Projects Committee Streamlines ASA Procedure... 173
Oregon Requires OK on Safeguards..... 173
ISO Agency for International Standardization..... 174
ISO and ASA Participation in the International Trade Fair, Chicago, August 7-20..... 175
$3 Million Cement Research Laboratory Opened..... 176
CMC Members Discuss Equipment and Product Quality Standards 178
Standards for the Steel Industry..... 179
Modular Coordination Program Under Way..... 184

NEWS—

Standards From Other Countries..... 182
Book Reviews..... 187
News Briefs..... 188

ASA Standards Activities—

American Standards—Status as of June 15, 1950..... 185
What's New on American Standard Projects..... 186

ASA
Reg. U. S. Pat. Off.

Ruth E. Mason, Editor Dollie Carpenter, Production Editor

Single copy, 35¢. $4.00 per year (foreign $5.00). Schools and libraries $3.00 (foreign $4.00). This publication is indexed in the Engineering Index and the Industrial Arts Index. Re-entered as second class matter Jan. 11, 1949, at the P.O., New York, N. Y., under the Act of March 3, 1879.

THE

American Standards Association

Presents this Certificate

to

Member of its

STANDARDS COUNCIL

In recognition of his contributions to the democratic processes leading to the establishment of voluntary AMERICAN STANDARDS, *and in appreciation of his sound advice and devotion of energy to the furtherance of the standards movement as a means of advancing the national economy.*

ASA

President _____ *Secretary* _____

In recognition of their work in development of nationally coordinated American Standards, 72 Standards Council members who have served for more than a year have received this honorary certificate. The award was presented by Thomas D. Jolly, president of the American Standards Association during ceremonies at ASA headquarters May 19. F. M. Farmer, president of the Electrical Testing Laboratories, New York, formally accepted the certificates on behalf of the entire group. Mr Farmer, a former chairman of the Standards Council, is among those whose standardization work extends over more than 25 years.

Council's Work Applauded as Public Service

by T. D. Jolly

Vice-President, Aluminum Company of America; President, American Standards Association

Mr Jolly presented certificates to Standards Council members at ceremonies May 19

THE smallest manufacturer and the giant corporation owe you a debt of gratitude for your time, thought, and hard work in the discharge of your duties. You are in a sense the trustees of voluntary standards. It is your wisdom that guides the standards movement and keeps it on a steady course. It is you who do the advance thinking to assure the future of voluntary standards and you who have the responsibility for maintaining the ASA as a focal point of standardization on a national and international level. I cannot overemphasize the value of a nationally coordinated set of standards as an effective management tool capable of maintaining economies of manufacture which can be passed on to the consumer whether that consumer be industry, the man on the street, or the housewife buying for her family.

Each of you represents a great trade association or technical society. Here in this room today sits a cross section of American commerce and industry. You are the forces that bind the members of ASA into a strong federation. The Standards Council, symbolizes ASA.

As a quasi-judicial body charged with safeguarding the all-party-at-interest and consensus principles of American Standards, the Standards Council is performing a public service which in itself is rewarding. But beyond this, it has been the desire of the Board of Directors to give you tangible evidence of appreciation for a job well done, and public recognition as the men responsible for more than a thousand American Standards which form the basis of mass production techniques.

I have singled out one of your elder statesmen to formally receive this award on your behalf. His interest in standardization extends over twenty-five years, back to the days when you were the American Engineering Standards Committee. He has been chairman of the Standards Council. Mr Farmer, may I present this award to you.

"The American Standards Association presents this certificate to F. Malcolm Farmer, member of its Standards Council in recognition of his contributions to the democratic processes leading to the establishment of voluntary American Standards, and in appreciation of his sound advice and devotion of energy to the furtherance of the standards movement as a means of advancing the national economy."

Standards Council Members Who Received Award

Paul Arnold, Ansco Division, General Aniline & Film Corporation—Photographic Manufacturers Group

L. B. Bellamy, Sterling Grinding Wheel Company—American Society of Tool Engineers

Albert B. Bingham, Divisional Director, Pittsburgh Plate Glass Company—National Paint, Varnish and Lacquer Association

Leland B. Bonnett, Vice President Consolidated Edison Company of New York—Electric Light and Power Group

George W. Booth—Fire Protection Group

Professor J. G. Brainerd, University of Pennsylvania—Institute of Radio Engineers

Arthur L. Brown, Chief Engineer Factory Mutual Engineering Division, Associated Factory Mutual Fire Insurance Companies—Fire Protection Group

John D. Capron, President, Glamorgan Pipe & Foundry Company—Cast Iron Pipe Research Association

Morris H. Cook, Director of Systems Engineering, Bell Telephone Laboratories, Inc.—Telephone Group

S. D. Daniels, Secretary, National Aircraft Standards Committee—National Aircraft Standards Committee

Erb N. Ditton, Gotham Hosiery Company—National Association of Hosiery Manufacturers

Miles V. Engelbach, Ruberoid Company—Asbestos Cement Products Association

F. Malcolm Farmer, President, Electrical Testing Laboratories, Incorporated—American Society for Testing Materials

Edward S. Farrow, Vice President, Eastman Kodak Company—Photographic Manufacturers Group

David C. Fenner, Vice President, Mack International Motor Truck Corporation—Automobile Manufacturers Association

Dr Karl L. Fetters, Special Metallurgical Engineer, Youngstown Sheet & Tube Company—American Iron and Steel Institute

Dr G. J. Fink, Secretary, Oxychloride Cement Association—Oxychloride Cement Association

William A. Flint, President, A. W. Flint Company—American Ladder Institute

William H. Fowler, Vice President, Dravo Corporation—Associated General Contractors of America, Incorporated

E. P. Gangewere, Superintendent, Motive Power and Rolling Stock, Reading Company—Association of American Railroads

Frederick K. Glynn, American Telephone and Telegraph Company—Society of Automotive Engineers

Fred J. Graf, Assistant Vice President and Chief Engineer, Massachusetts Bonding & Insurance Company—Association of Casualty and Surety Companies

John V. Grimaldi, Director, Industrial Division, Association of Casualty and Surety Companies—Association of Casualty and Surety Companies

Robert G. Griswold, Cities Service Company—American Gas Association

Fred E. Harrell, Manufacturing Vice President, Reliance Electric & Engineering Company—American Institute of Electrical Engineers

Charles Rufus Harte, Engineer, The Connecticut Company—American Institute of Electrical Engineers

John Hellstrom, Vice President, American Air Filter Company, Incorporated—Foundry Equipment Manufacturers Association, Incorporated

(*Continued on page* 169)

Council Plays "*Watchdog*"—
Democratic Methods at Stake

by F. M. Farmer
President, Electrical Testing Laboratories, Inc
Past Chairman, Standards Council

DECEMBER 31, 1949, brought to a close my 25 years of continuous membership on the Standards Council of ASA as a representative of the American Society for Testing Materials. During that long period I have had many enjoyable experiences as a Councilor, but none has given me more pleasure than the present privilege of accepting on behalf of the 72 recipients, these ASA Awards of Service, and of thanking you, Mr. President, on their behalf.

The Standards Council membership is limited to representatives of the Member-Bodies of the Association. These groups became affiliated with the Association for reasons helpful to their respective organization objectives. Some became members because they believed that a national clearinghouse for standards was essential to economic and social progress in this country and made this evident through their membership. Some joined to support the program of voluntary standards channeling through ASA. Still others may have become members as a matter of self defense. Perhaps others became members because this new channel of communication between competitors, customers, governmental agencies, technology, and the general public offered definite advantages and privileges to them which could be obtained in no other way, and through which the group could, at the same time, make a contribution to the advancement of the national economy.

Legitimate Self-Interest

All of these motives are varying degrees of self-interest, direct or indirect. They are all perfectly proper and legitimate reasons, particularly in the highly complicated industrial and commercial spheres of human activity with which the ASA is principally associated. The protection of one's own interests, prerogatives, and privileges, when no damage is done to others or to the public interest, has always been accepted as a perfectly proper motive.

It may, therefore, be expected that the individuals serving on the Council as representatives of these Member-Bodies have each served in accordance with the degree of interest in the objectives of ASA which their group believed justified its membership in ASA. Naturally, therefore, some Councilors have been more active than others. Many, having developed a personal interest beyond that of the group which they represented, have served extensively on special committees and boards that have been created from time to time for the purpose of improving the necessarily somewhat complex procedure incident to the sound development of ASA objectives in the interest of all groups.

Convinced of Value

Very few members of the Council, if any, have terminated their membership without having become thoroughly convinced of the value to all concerned of the basic objectives of ASA to bring into being a consistent group of standards known as "American Standards," thus designated because they are the result of coordination of the ideas, principles, and information of all groups concerned, as demonstrated by their affirmatively expressed approval of the content of those standards. Through their review of the reasons advanced for the initiation of projects under ASA procedure, the limitations placed on scopes of projects, the examination of personnel of committees to assure that all having a substantial interest have been afforded the opportunity to participate, and review of the evidence presented showing the development of the standard and its acceptance or rejection by the groups concerned, they could but be convinced that the use of ASA procedures in the development and approval of American Standards protects the rights of all groups, particularly of minority groups, and redounds to the benefit, credit and prestige of all concerned.

"Paper Work" Delegated

Membership on the Standards Council is not as exacting as it used to be. In earlier days, Councilors necessarily had to deal with many details concerned with the processing of an approved proposal through to the final status of American Standard. Naturally, with the expansion of ASA activities in more and more fields, the "paper work" devolving on Councilors became burdensome. This situation was relieved by setting up what in effect are sub-councils—namely industry correlating committees, and other committees—to handle much of the necessary routine work of the Council.

It may be felt by some of the Councilors that the Council itself is having less and less to do. That may be true with respect to the so-called "paper work," but its responsibilities are ever increasing with the expansion of the Association's activities.

Even though the Standards Council has delegated most of its duties and powers to the correlating committees and to the Board of Review, final authority still rests with the Council. It has the responsibility of being assured at all times that these agencies of the Council perform their duties and exercise their powers clearly within the basic policies of

the Association, and with efficiency and dispatch. To be thus assured, the members must maintain contact with ASA operations in sufficient detail to get a concrete picture of what is going on and thus be able to discuss intelligently any activity which, in their opinon, is not being satisfactorily carried on. This function of the Council becomes more important as the activities of the Association expand into new fields, particularly those in which the meaning and significance of standardization is sketchily understood.

Dual Responsibility

The Councilor has responsibilities in two other directions. First, he has the responsibility of representing the organization which appointed him from the point of view of its direct interest in policy and procedural matters coming before the Council for discussion. Just what are the direct interests of a Member-Body in particular matters coming before the Council is not always easy to define. For instance, technically speaking, specifications for rayon fabrics may appear to be of little or no interest to the coal-producing industry. But is that true with respect to the procedure and policy to be followed? The air-conditioning industry may be intensely interested in specifications for copper tubing, not only technically but also with respect to procedure and policy, while on the other hand, it may not be technically interested in rock-dusting in coal mines. But does that mean that the air-conditioning industry should not be concerned with the procedure and policy proposed to be followed in developing rock-dusting standards? In both of these hypothetical cases the industries used as examples should, it seems to me, be interested in the many standards processed through ASA machinery which technically may seem far removed from their interest. They should be interested because the procedure and basic policies back of that machinery are ASA's "stock in trade," and if improperly or arbitrarily applied, used, or interpreted in one case, there is no assurance that they won't be misused in another. The Council members are all watchdogs for the same chicken coop. The chickens in the coop may be Plymouth Rocks, Rhode Island Reds, or White Leghorns, but there are no favorite breeds and no favorite burglars.

President T. D. Jolly (left) presenting certificate to F. M. Farmer on behalf of the 72 members of Standards Council who received the awards of merit.

To Advance ASA

Second, the Councilor has responsibility for advancing and supporting in every possible way the operations of ASA as a focal point of the national standards movement. In representing a particular Member-Body a Councilor must assume, of course, that that body believes in the national standards movement, that American Standards are important tools in advancing the national economy, that American Standards are and can become increasingly important in international trade, and that the American Standards Association is the appropriate national channel through which such standards can be devolped by the groups concerned. Such assumption is based on the principle that before becoming a Member-Body of ASA, the organization has read the Constitution of ASA and believes that it should be associated with other national organizations in a cooperative endeavor to attain the objects for which ASA was organized—in other words, to work for the good of the whole as well as for itself as a Member Body. If that be a correct picture, and I think it is, then the individual Councilor becomes a key figure in ASA operations and a very considerable degree of responsibility is attached to his office.

While these last two responsibilities are presented separately, they are in reality one. To properly represent the individual Member-Body, the Councilor must pay attention to the whole. If the interests of the whole are adequately protected and advanced, the interests of the individual Member-Body will also be protected and advanced.

Finally, may I suggest that the attitude of the Councilor to his job should be a judicial one. Like the judge in the law court with respect to the laws of the land, the Councilor

(*Continued on page* 186)

A World-Wide Guide to Film Exposure

by M. G. Anderson

FROM the earliest beginnings of photography, the problem of proper exposure has perplexed the photographer. Through trial and error, under chosen and standardized light conditions, the expert has established his standards of exposure. Various light meters, photocell or otherwise, are available to assist the less expert (or even the expert under nonstandard conditions) to estimate the luminance of the scene to be photographed. However, there is still a demand for an inexpensive method of estimating proper camera exposure.

Photographed on Ansco Film

Vacation pictures in unfamiliar latitudes can be exposed correctly using the simple geographical latitude tables in the American Standard computer.

Use Radiant Energy Data

"Exposure" tables have been published for many years. These usually assign numbers representing the amount of light available at various hours of the day and months of the year which, combined with other factors of atmospheric conditions and film speed, yield exposure recommendations in terms of lens stops and shutter speeds. However, these tables have not usually made use of the large amount of modern, reliable data compiled during the last few decades concerning the amount of radiant energy that reaches the earth's surface from the sun.

During the war, the United States Navy asked the ASA sectional committee on photography to prepare a guide to exposure of sensitized film under various conditions all over the world for use by members of the Armed Services. The material was prepared by the Z38 sectional committee on photography as a War Emergency Standard in the form of a handy booklet which could be used under field conditions.

This computer consisted of three essential parts: (1) light tables evaluating the amount and type of light available for camera exposure; (2) scene tables, analyzing the types of scene structure which were to be photographed; (3) a method of using these values to compute camera exposures.

Reports on the use of the computer were favorable. In the course of the regular program to review the War Emergency Standards, Sectional Committee Z38 therefore decided that it was worthy of revision as a regular peacetime standard. To do this, a subgroup was appointed from personnel of subcommittee 2 of Z38.

Fortunately, there existed fundamental data[1] from which this revision could be carried out. Dr Loyd A. Jones, Eastman Kodak Company, and Dr N. R. Condit, also with Eastman, had made an exhaustive analysis of data relating to the amount of radiant energy and light reaching the earth's surface from the sun and sky. Indeed, it was on some of their unpublished work that the War Emergency Computer data were originally based. Their recent work, made available to

Principles incorporated into the American Standard Exposure Computer were worked out by a committee of scientists in the field, and through the cooperation of 45 national technical societies and leading manufacturers of optical and photographic equipment on an ASA sectional committee sponsored by the Optical Society of America.

Members of the subgroup which developed the new edition of the standard were: C. N. Nelson, Eastman Kodak; J. McFarlane, Eastman Kodak; Allen Stimson, General Electric; A. T. Williams, Weston Electrical Instrument Corporation; and M. G. Anderson, Ansco, (author of this article).

The Computer contains 25 durable loose-leaf pages, 3¼ x 4¾ in., and has a flexible, fabricoid cover. Copies may be obtained at $1.00 from the American Standards Association.

[1] Sunlight and Skylight as Determinants of Photographic Exposure, Loyd A. Jones and N. R. Condit, Journal of the Optical Society of America, Vol. 38, No. 2, Feb. 1948.

the subgroup appointed to revise the standard, gave adequate and fundamental information for their use. This led to some revision of the light tables in the new standard. Further consideration was given to the descriptions of the scene structure in view of experiences with the War Emergency Standard and the prac-

tical experience of generations of photographers. New illustrations of different types of scenes (close-up, nearby, semi-distant, distant) which meet the definitions and requirements more exactly are shown and are more in line with civilian photographers' experience. In addition to the spatial structure of the scene, consideration is given in the computer to local luminance, unshaded, light shade, heavy, and dense shade conditions.

In order to increase the usefulness of the standard, it was decided to extend the scope beyond negative materials to include reversible materials, both black-and-white and color. This was done by including a separate scene structure table. The relatively narrow latitude of these materials in comparison to negative materials

(*Continued on page* 188)

Award

(*Continued from page* 165)

Raymond T. Henry, Chief Electrical Engineer, Buffalo, Niagara & Eastern Power Corporation—American Institute of Electrical Engineers

T. R. Higgins, Director of Engineering, American Institute of Steel Construction, Incorporated, American Institute of Steel Construction, Incorporated

Luther W. Hill, President, Carolina Telephone & Telegraph Company, Telephone Group

Frank O. Hoagland, Vice President, Pratt & Whitney Division, Niles-Bement-Pond Company — National Machine Tool Builders' Association

Lawrence C. F. Horle, Radio Manufacturers Association—Radio Manufacturers Association

A. S. Hunt, Chief Engineer, Communication and Signals, Baltimore & Ohio Railroad—Association of American Railroads

Donald E. Hyndman, Manager, Motion Picture Film Sales, Eastman Kodak Company — Society of Motion Picture and Television Engineers

William F. Hurd, General Outdoor Advertising Company — Outdoor Advertising Association of America, Incorporated

Arthur S. Johnson, Vice President and Manager, Engineering Department, American Mutual Liability Insurance Company—National Association of Mutual Casualty Companies

Harry E. Jordan, Secretary, American Water Works Association — American Water Works Association

Laurence W. Kattelle, Assistant Chief Engineer, Walworth Company — American Society of Mechanical Engineers

W. Dean Keefer, Vice President and Manager Engineering Department, Lumbermen's Mutual Casualty Company—National Safety Council

Richard G. Kimbell, Director Technical Services, National Lumber Manufacturers Association — National Lumber Manufacturers Association

William P. Kliment, Engineer of Standards Engineering and Research Division, Crane Company—Manufacturers Standardization Society of the Valve and Fittings Industry

Walter S. Lacher—Association of American Railroads

Stewart E. Lauer, President, York Corporation—Air Conditioning & Refrigerating Machinery Association

Earl R. Maize, Director Safety Division, National Coal Association — National Coal Association

Charles M. Mapes, Transmission Engineer, American Telephone and Telegraph Company—Telephone Group

Alan R. Martin—Screw Industry Standards Committee

Harold Massey, Assistant Managing Director, Gas Appliance Manufacturers Association — Gas Appliance Manufacturers Association

Thomas B. McMath, Director, Division of Inspection and Accident Prevention, Maryland Casualty Company—Association of Casualty and Surety Companies

Dr Paul H. Nystrom, President, Limited Price Variety Stores Association, Incorporated — Limited Price Variety Stores Association, Incorporated

Henry B. Oatley, Consulting Engineer, Combustion Engineering — Superheater, Incorporated—American Society of Mechanical Engineers

Charles M. Parker, Secretary, General Technical Committee, American Iron and Steel Institute—American Iron and Steel Institute

Harry C. Plummer, Director Engineering and Research, Structural Clay Products Institute—Structural Clay Products Institute

Charles M. Pond, Vice President, Pratt & Whitney Division, Niles-Bement-Pond Company—Metal Cutting Tool Institute

Maurice N. Quade, Parsons, Brinckerhoff, Hall and Macdonald—American Society of Civil Engineers

Gordon Sawyer, Motion Picture Research Council, Incorporated—Motion Picture Research Council, Incorporated

Robert A. Seidel, Vice President, RCA Victor Division, Radio Corporation of America—National Retail Dry Goods Association

William Seubert, Arrow-Hart & Hegeman Electric Company—National Electrical Manufacturers Association

Maurice Stanley, President, Fafnir Bearing Company — Anti-Friction Bearing Manufacturers Association, Inc.

Richard C. Sogge, Manager, Standards Division—Executive Department, General Electric Company—National Electrical Manufacturers Association

R. C. Sollenberger, Executive Secretary, Conveyor Equipment Manufacturers Association—Conveyor Equipment Manufacturers Association

David V. Stroop, Assistant to the President, American Petroleum Institute — American Petroleum Institute

Paul W. Thompson, Vice President in Charge of Engineering, Detroit Edison Company — Electric Light and Power Group

Frank Thornton, Jr., Engineering Manager — Association Activities, Westinghouse Electric Corporation — National Electrical Manufacturers Association

Rowland Tompkins, President, Rowland Tompkins & Son, Incorporated— Heating, Piping & Air Conditioning Contractors National Association

John R. Townsend, Materials Engineer, Bell Telephone Laboratories, Inc. — American Society for Testing Materials

Theodore E. Veltfort, Manager, Copper & Brass Research Association—Copper & Brass Research Association

Walter C. Wagner, Philadelphia Electric Company — Electric Light and Power Group

William G. Waltermire, Chief Products Engineer, Lamson & Sessions Company—Industrial Fasteners Institute

Curtis R. Welborn, President, Underwriters' Laboratories, Incorporated—Fire Protection Group

Louis H. Winkler, Metallurgical Engineer, Bethlehem Steel Company — American Iron and Steel Institute

Charles L. Wiswall, Special Assistant to Management, Photo Products Department, E. I. duPont deNemours & Company — Photographic Manufacturers Group

Wallace V. Wolfe, President, Motion Picture Research Council, Incorporated—Motion Picture Research Council, Incorporated

How Well Does an Earphone Work?

by Dr Leo L. Beranek

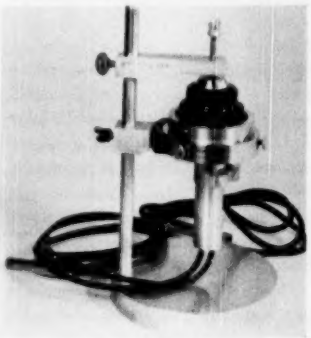
OF use to all who make basic acoustic measurements, two new American Standards, one on microphones and the other on testing of earphones, together with a revision of an existing American Standard on the primary calibration of laboratory microphones, have just been issued.[1] These standards are important to manufacturers of telephones, purchasers of radio-telephone equipment, hearing aids, microphones, and headphones.

Calibration of Microphones

Early in World War II, it was learned that primary calibrations from various laboratories differed by as much as 2.0 decibels. Through the use of the Western Electric 640AA condenser microphone; the reciprocity technique for performing the calibration; and the perfecting of the details of the physical apparatus, a calibration accuracy of $\pm$ 0.1 decibel was achieved. This research was performed primarily at the National Bureau of Standards and at the wartime Electro-Acoustic Laboratory at Harvard University. The American Standard Method for the Pressure Calibration of Laboratory Standard Pressure Microphones Z24.4-1949 is an outgrowth of those researches, but it is not limited to use with one type of microphone. Miniature crystal and condenser microphones of a variety of physical configurations may be calibrated in accordance with the standard.

[***Editor's Note:*** *The reciprocity techniques outlined in this new edition supersede the original calibration techniques described in the American Recommended Practice for the Calibration of Microphones, Z24.4-1938. Although it is not the intent to reject the older methods of calibration (use of thermophone, piston-phone, Rayleigh disk, etc), the committee believes that the methods described represent the best practice consistent with the present state of the art. "This relatively new technique will yield more accurate results over a wider frequency range than any of the older methods, and is more convenient to use in the laboratory," declares the Introduction to the standard.*]

With the reciprocity method of calibration, a reversible transducer, a microphone, an auxiliary source, and a small coupling chamber capable of being filled with hydrogen are required. The microphone to be calibrated may act as the reversible transducer. In one part of the experiment, the reversible transducer and the microphone join a rigid-walled cavity (coupler). The reversible transducer is actuated by a known electrical current and the open-circuit voltage of the microphone is measured. This test yields a transfer impedance. Another part of the test involves the comparison of the open-circuit voltage outputs of the reversible transducer and the microphone when they are joined in succession to the coupler along with the auxiliary source. This test yields the ratio of the sensitivities of the transducers when they are both operating as microphones. Finally, the impedance of the reversible transducer is measured and the volume of the cavity, angular frequency, and barometric pressure are determined. The desired calibration is the ratio of the open-circuit output voltage to the sound pressure acting over the surface of the diaphragm. Correction factors are included in the standard for heat conduction at the cavity walls, for the shunting effect of the acoustic impedance of the diaphragms on the acoustic impedance of the coupler cavity, and for the presence of capillary tubes necessary



Receiver mounted for calibration on 6 cc coupler

[1] *The Sectional Committee on Acoustical Measurements and Terminology, Z24, sponsored by the Acoustical Society of America under the procedure of American Standards Association, was responsible for the work on these standards. Directly in charge of their preparation was a writing group consisting of B. B. Bauer of Shure Brothers Manufacturing Company, L. L. Beranek of the Massachusetts Institute of Technology, R. K. Cook of the National Bureau of Standards, F. F. Romanow of the Bell Telephone Laboratories, F. Massa of Massa Laboratories, W. Wathen-Dunn of the Naval Research Laboratory, and F. M. Wiener of the Bell Telephone Laboratories. The general responsibility for the work of this writing group rested with Subcommittee Z24B on Fundamental Acoustic Measurements.*

Dr Beranek, Technical Director of the Acoustics Laboratory, Massachusetts Institute of Technology, played a prominent part in preliminary research that led to final development of the three new fundamental American Standards on acoustic measurement. From 1940 to 1946 he was director of the wartime Electro-Acoustic and Systems Research Laboratory at Harvard University, one of the three great laboratories which have contributed their experience to these standards. Dr Beranek is credited with having devised a new method of precision measurement of acoustic impedance, and as having designed a new type of anechoic sound chamber. He is co-author of Principle of Sound Control in Airplanes *(1944) and author of the recently published* Acoustic Measurements. *He is vice-chairman of the Sectional Committee on Acoustical Measurements and Terminology, Z24.*

for the introduction of hydrogen. Hydrogen is introduced to extend the measurements to higher frequencies (up to 12,000 cps).

In an appendix, a technique for the secondary pressure calibration of small microphones and for the difference between the free-field and coupler calibration of a 640AA Western Electric condenser microphone are given.

Standard Microphones

In connection with the other standards activities of Subcommittee Z24B on Fundamental Measurements, it became apparent that one common element was needed in many of the standards being prepared. This element was the standard microphone.

In an effort to avoid repeating in each of the standards the essential characteristics of the microphone to be used, it was decided to write a separate specification. This American Standard Specification for Laboratory Standard Pressure Microphones, Z24.8-1949 described types of laboratory microphones whose properties as secondary standards are in accordance with the best practice of the present-day art and which are intended for use as acoustic measurement standards either in free-field or in conjunction with a variety of devices, such as artificial voices and ears. These microphones lend themselves to calibration in absolute terms by the reciprocity method as specified in Z24.4-1949.

Three basically different types of standard microphones are included. The type L is designed for use in the audible frequency range and may have a pressure response as low as —60 db *re* 1 volt per microbar. The type M is designed for the medium frequency range up to about 50 kc, and may have a pressure response as low as —95 db. The type H microphone is designed for operation up to about 250 kc and may have a pressure response as low as —110 db.

There is also specified the tolerable temperature coefficient, ambient temperature coefficient, humidity characteristic, output impedance, and mechanical stability of the microphone and other important factors.

This specification should be of value to all manufacturers of microphones, loudspeakers, and electro-acoustic equipment, as well as to research laboratories. It permits the user to judge whether the microphone that he contemplates using in a laboratory as a standard is suitable at the present state of the art.

Although the standard as now written does not cover all possible developments in microphones which may result in years to come, it is not meant that these microphones should be barred from possible adoption. By serving as a yardstick of performance, new microphones which are developed may be admitted in the laboratory as standards when it is demonstrated that their performance

THE microphones and earphones which form an important part of hearing aids require careful scientific tests to check how well they are performing. So do telephone receivers, radio headphones, loudspeakers, and noise meters. Dependable performance of microphones and earphones makes it possible for airplane pilots to hear their radio signals despite the roar and vibration of the plane. A telephone operator hearing a clear, reliable tone through her headphone can place her calls efficiently. A manufacturer of automatic household equipment can rely on a meter checked in accordance with standard tests when he checks the noise his equipment makes. Above all, a person with impaired hearing can count on good service when his hearing aid meets standard performance tests.

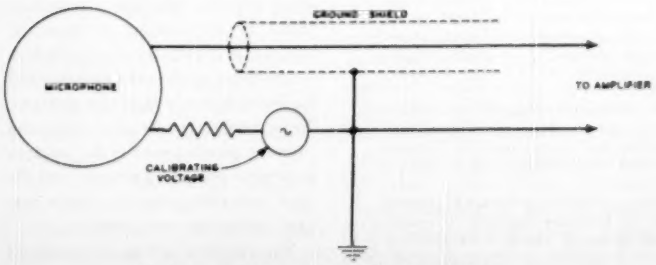
Two important new American Standards now provide a series of laboratory methods for checking the performance of microphones which in turn are used to test such electro-acoustic equipment as loudspeakers, noise meters, telephone receivers, radio headphones, and hearing aids. A third standard describes means for checking the performance of earphones. The first standard provides a primary method for calibrating laboratory microphones; the second continues with specifications for laboratory standard pressure microphones; and the third provides methods for using this equipment in conjunction with artificial ears for checking the performance of earphones.

These standards, sponsored by the Acoustical Society of America, have been published by the American Standards Association:—

American Standard Method for the Pressure Calibration of Laboratory Standard Pressure Microphones, Z24.4-1949 ..... 75 cents

American Standard Specification for Laboratory Standard Pressure Microphones, Z24.8-1949 ..... 50 cents

American Standard Method for the Coupler Calibration of Earphones, Z24.9-1949 ..... 75 cents



Technique of introducing calibrating voltage.

equals or exceeds the state of the art as illustrated in this document.

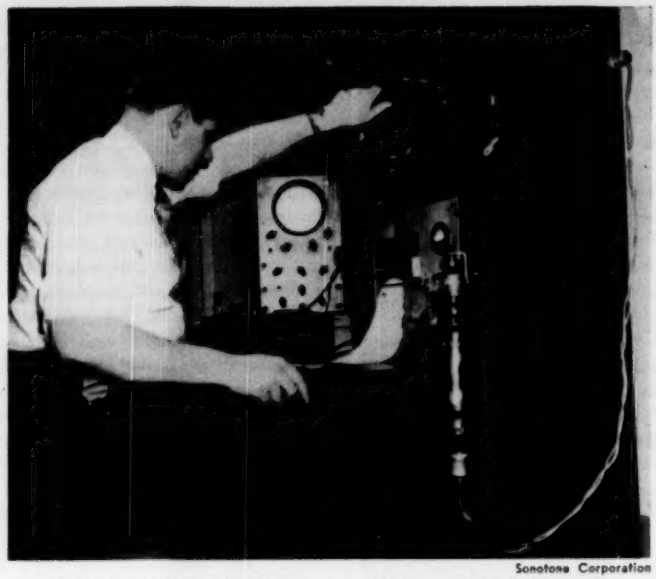
Calibration of Earphones

Following the growth of the hearing aid industry and the experience gained in World War II in supplying large quantities of earphones to the air forces, the army, and the navy, the method for the coupler calibration of earphones, Z24.9-1949, was developed.

Earphones are used by pilots in all airplanes and by those who operate noisy ground vehicles. The users of hearing aids today are numbered in tens of thousands.

It is recognized that techniques that can be used to calibrate earphones, such as telephone and hearing aid receivers, may be divided into two classes: physical methods and subjective methods. In particular, the physical method of this standard requires the coupling of the earphone to be tested with a standard microphone through the medium of an air volume of simple shape called a *coupler*. The enclosed volume of the coupler is approximately equal to that enclosed by the earphone and the ear under normal conditions of use. Primarily, the usefulness of this method is limited to the frequency range below 5000 cps, and to comparing and maintaining the quality of identically designed earphones.

The coupler calibration differs from calibration using real ears in that with the coupler method there is not included ear diffraction occurring in direct listening, ear leakage around the earphone cushion, losses due to coupling the earphone to the ear, or resistance losses that occur in the ear. Although a real-ear method would seem to be more inclusive, the disadvantage is that it would involve human subjects and this would necessitate a great number of tests in order that the results be statistically meaningful. The more simple coupler method is adopted for routine comparisons. It is emphasized that correlation between real-ear performance and coupler performance must be established separately for each earphone design, when a knowledge of the performance on users' ears is accurately desired.



Sonotone Corporation

Testing a hearing aid receiver on an artificial ear (right foreground).

The standard begins with a list of definitions. Next, three types of couplers are shown; one for measuring earphones which rest primarily against the outer ear; one for earphones which attach to plastic-moulded ear pieces; and one for earphones which extend part way into the ear canal and make a seal by means of flexible tips. A standard pressure microphone of the type described in the American Standard Specification for Laboratory Standard Pressure Microphones, Z24.8-1949, is used. In the test, the earphone is driven from a resistive generator whose open-circuit voltage is held constant. The sound pressure generated by the earphone in the coupler is measured with the microphone. The procedure for performing the measurements and the calculations is carefully outlined. The standard closes with an appendix covering power losses at the junction between a practical generator and the ideal resistive generator which was used during the measurements.

This standard will be of particular

(*Continued on page* 187)

Requirements for audiometers used in measuring the sensitivity of hearing are being coordinated by the American Medical Association with American Standard specifications prepared by the Sectional Committee on Acoustical Measurements and Terminology. In a report published in the Journal of the American Medical Association July 30, 1949, the Council on Physical Medicine and Rehabilitation presented minimum requirements which pure tone audiometers for diagnostic purposes must meet in order to be placed on the approved list of the Council. These requirements call for the use of the National Bureau of Standards coupler 9-A "or its acoustic equivalent" for measurements of sound-pressure output of certain types of audiometers. For other types "the methods of comparison advised by the National Bureau of Standards or specified by the American Standards Association, Incorporated, are to be employed.

The NBS coupler 9-A has been used by audiometer manufacturers and the National Bureau of Standards as a standard coupler for many years. The Council foresees that the new Type 1 coupler recommended in the American Standard on Coupler Calibration of Earphones, Z24.9-1949, will gradually replace the 9-A coupler.

"The phrase 'or its acoustic equivalent' in the present requirements is intended to include any standard coupler approved by the American Standards Association as a substitute for or to replace the National Bureau of Standards coupler 9-A," the Council explains.

Miscellaneous Projects Committee Streamlines ASA Procedures

AS a final step in streamlining its procedures, ASA has organized a Miscellaneous Projects Correlating Committee. Such important work as standards for gas burning appliances, office equipment and practices, optics, petroleum products and lubricants, and specifications in the metal and chemical fields will be under its supervision.

George H. Harnden, Standards Division, General Electric Company, has been elected chairman. Mr Harnden represents the American Society for Testing Materials. E. O. Mattocks of the American Petroleum Institute is vice-chairman.

Until the organization of the new Miscellaneous Projects Correlating Committee the work under its jurisdiction had been handled by the Board of Examination. Because the Board had only limited authority, standards under its jurisdiction had to be approved by the 80-man Standards Council. Correlating committees, which have authority to take final action on initiation of projects, appointment of sponsors, approval

George H. Harnden

of committee personnel, and active supervision of committee progress, refer standards under their jurisdiction to the 6-man Board of Review. Organization of the new Photographic Correlating Committee, and broadening the scope of the former Building Code Correlating Committee have permitted assignment of many of the standards formerly under the scope of the Board of Examination to these committees. Organization of the Miscellaneous Projects Correlating Committee places the rest under correlating committee supervision. Speedier action is assured since standards recommended for approval can now be acted on by the Board of Review.

As one of its first acts, the MPCC authorized its officers to discuss possible reassignment of projects which it feels might better be handled by the Mechanical Standards Committee. In order to familiarize itself with all projects under its supervision before taking any action, the Committee has asked sectional committees to submit a status report.

The MPCC will also handle some of the international work done by ASA committees through the International Organization for Standardization. U. S. cooperation on international projects, such as those on viscosity, the plastics industry, and petroleum products will come within its scope.

Organizations represented on the Miscellaneous Projects Correlating Committee are: American Council of Commercial Laboratories; American Gas Association; American Institute of Physics; American Society of Mechanical Engineers; American Society for Testing Materials; and the American Petroleum Institute.

Oregon Requires OK on Safeguards

(Reprinted from Safer Oregon, *published by the State Industrial Accident Commission, March, 1950.)*

MACHINE and equipment guarding by the manufacturer or distributor will receive new impetus under requirements of Oregon's new safety law which took effect Oct. 1, 1949. Enforcement of this act should play an important part in helping to reduce the large number of machine-caused accidents, which in 1948 amounted to 10.7% of the total number of claims received by the Industrial Accident Commission.

Code rule No. 3.1 in Oregon's Basic Safety Code, Part 1, provides that beginning with the effective date of this code (10/1/49), machines or equipment or attachments for machines or equipment must be guarded in accordance with the provisions of the safety codes, and that the owner, manufacturer or distributor shall apply for and obtain certified approval from the State Industrial Accident Commission for such equipment before it is placed in operation within the state. This rule includes new, used and rebuilt machines and equipment.

The rule prohibits the use of any machine or equipment or attachments for same not so approved if installed after the effective date of the code, unless it is in strict compliance with all safety requirements as contained in the various applicable safety codes and as pertinent thereto.

To secure such approval, application must be made in writing to the Safety Standards Section of the Accident Prevention Division of the Industrial Accident Commission at Salem, giving a full description of the operation of the device or equipment for which approval is requested, together with a complete set of instructions for its use or operation, a complete set of materials specifica-

(Continued on page 177)

Oregon Certificate of Approved Safeguarding of Equipment.

ISO—Agency for International Standardization

Albert Caquot
President, ISO

WITH interest and representation reaching out into nearly every field in the realm of international economic and social relations, the International Organization for Standardization (ISO) stands squarely and avowedly as a promoter of world peace. More important, the ISO is working concretely, as well as philosophically, on the acts of unification that are necessary in achieving a peace. American industry, through the American Standards Association, is lending its support and creative help to many of these world unification problems.

The ISO is as young in years as the UN and has actually run a parallel historical course to that federation, being conceived from another organization (the International Federation of National Standardizing Associations), that, similarly, operated between the two World Wars. The ISA necessarily stopped functioning with the advent of the second World War and, when a lack of uniform technical standards evidenced itself in costly manufacture of arms and equipment and loss of time, much of the standardization work was given over to a United Nations Standards Coordinating Committee. However, the committee was formed late in the war and functioned mainly in the post-war period. It set up committees to deal with the changed world conditions and prepared the way for the formation of a new international standards organization. This was the ISO which formally came into being in July 1947, with headquarters in Geneva, Switzerland.

The United States, through the American Standards Association, contributed the first international president of the new ISO in the person of Howard Coonley, formerly president of the ASA and the National Association of Manufacturers and chairman of the Walworth Company, and presently chairman of the ASA Executive Committee. When his three-year term as head of the new international standardizing group ended in January, he was succeeded by France's Albert Caquot, pioneer in French standardization work, president of their national standardizing body since 1943, and otherwise honored for his engineering contributions by election to membership in the Institute.

Work Speeded

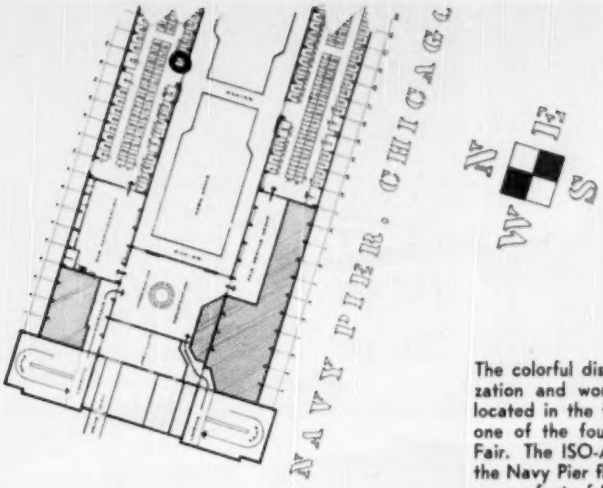
In its brief three-year span, the new International Organization for Standardization has not only taken up and preserved much of the valuable work begun by its predecessor, the ISA, but has actually enlarged the scope and application of international standardization work at a hearteningly accelerated rate. From a pre-war total of 22 ISA nations working out international standardization through 47 technical committees, the ISO now numbers 28 member-nations and has 72 technical project committees and a number of subcommittees. An additionally important development has been the affiliation of the IEC (International Electrotechnical Commission) as an ISO technical division. A separate organization, with headquarters of its own in Geneva, the IEC dates from 1906 and has a respected body of adopted work to show for the coordinated efforts of 26 member-nations. IEC's affiliation with ISO assures unification between international electrical standardization and the work being done in other fields.

Henry St. Leger
General Secretary, ISO

Energetic Henry St. Leger's work as general secretary since 1947 has been an important factor in bringing about the amicable cohesion of 28 nations in ISO. An American born in Paris and educated in England, France and the U. S., he brought a true cosmopolitan background of interest to the ISO administrative post. Before the ISO appointment he served as director of the Paris Branch of the U. S. Chief Consul for Axis Criminality and played a major part in organizing the Nurnberg trials. The 28 countries now routing their ISO communiques through his Geneva office are: Australia, Austria, Belgium, Brazil, Canada, Chile, Denmark, Finland, France, Hungary, India, Israel, Italy, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Switzerland, Sweden, Czechoslovakia, Union of South Africa, United Kingdom, Uruguay, United States of America, Russia, and Yugoslavia. Of these, Great Britain, the U. S., Russia, and France are completing initial five-year periods as ISO Council members. The other Council members, appointed for three-year terms, are: Australia, Belgium, Mexico, Norway, and Switzerland. China's seat as a five-year term member has been vacated and the filling of the vacancy will be considered by the ISO Council which is meeting in Geneva in July.

Of the 72 projects now in work by the technical committees of the ISO, the scope of interest ranges from the prosaic but modern subject, Packag-

(Continued on page 188)



The colorful display booth pictorially describing the organization and work of both the ISO and the ASA will be located in the famous Chicago Navy Pier building (above), one of the four buildings housing the International Trade Fair. The ISO-ASA booth, D11, is circled in the section of the Navy Pier floor plan shown at the left. To date 180,000 square feet of floor space has been taken by American and foreign exhibitors who will comprise the international show.

ISO and ASA Participation in the International Trade Fair, Chicago, August 7-20

Standardization looms so large in many aspects of international trade that it has seemed worthwhile to the General Secretary of the ISO and to the ASA to share a booth at the first International Trade Fair at Chicago. An early decision has resulted in a choice location near the entrance to that part of the fair which will be staged on the upper deck of the Navy Pier at Chicago.

For the ISO the exhibit will feature the world-wide makeup of the organization, a statement of its objectives and indications of the work currently in hand. For the American Standards Association the exhibit will present specimens of standards, particularly those of interest in international trade, together with information on the services which the ASA can render to American industry. It will stress particularly the fact that the ASA has a library of standards from 28 foreign countries and is ready at all times to provide information as to the titles of such standards and to arrange for their loan or in some cases their sale, if desired.

G. F. Hussey, Jr.

Kaufmann and Fabry, Chicago

Chicago, Illinois, where the First United States International Trade Fair will be held in August.

$3 Million Cement Research Laboratory Opened

THE Portland Cement Association opened its new $3 million Research and Development Laboratories June 8 at Skokie, Illinois. The new buildings (93,000 square feet of usable floor space) are equipped with every type of device for testing cement and concrete—including rooms where the climatic conditions of any place in the world can be reproduced. The Association's research and development work, for which the Laboratories will be the headquarters, helps in developing new and less expensive methods of using cement and concrete in homebuilding and for household purposes; in the construction of highways and public buildings; in developing soil-cement (utilizing soil on the site of the construction to form a hard surface economically); in using cement and concrete for dams and conservation; and for firesafe schools, hospitals, and commercial buildings. These represent only a few of the most important projects. In addition to the new Laboratories, the Association maintains a staff of fellowship scientists at the National Bureau of Standards, and numerous field exposure laboratories throughout the United States.

The Portland Cement Association is devoted entirely to research, development, and education, its activities being supported by 67 member companies. Its policy is to make scientific discoveries and new developments relating to the use of cement and concrete freely available to cement users.

Cooperates on Standards

The Association cooperates in standards work of several associations, as well as the American Standards Association. For many years the PCA and its member companies have taken a leading part in standardization work on design and construction codes developed by the American Concrete Institute. It has recognized the importance of a nationwide standards program, not only by supporting the American Standards Association as a Member-Body but also as a member of a number of sectional committees under the procedure of ASA. These include committees working on fire tests of building construction and materials; methods of testing road and paving materials; building code requirements for masonry; for fire protection and fire resistance; for excavations and foundations; specifications for plastering, and the American Standard methods of compiling and recording accident statistics.

Through the American Society for Testing Materials' Committee C 1 on Cement, the industry has channeled the results of its research into methods of test and specifications for all types of hydraulic cement. Much of this standardization work has led to American Standards. More than 20 standards that relate to one or more phases of cement technology or to requirements covering the use of cement and concrete have been approved by the American Standards Association. The two most important of these are the American Standard Specifications for Portland Cement (ASTM C 150-49) A1.1-1950 and the American Standard Building Code Requirements for Reinforced Concrete (ACI 318-47) A89.1-1948.

New Concrete Designs

The Portland Cement Association first established laboratories in Chicago in 1916. From these first laboratories came the water-cement ratio principle of proportioning concrete mixtures. This principle established the fact that for plastic mixtures using sound and clean aggregates the

strength and other desirable properties of concrete under given job conditions are governed by the amount of mixing water used per unit of cement. It enabled builders for the first time to design concrete mixtures for definite strengths and service requirements.

Soil-cement is another example. The objective was to develop a type of paving material low enough in cost to fit the paving requirements of more than two million miles of local rural roads and residential streets which carry too little traffic to call for heavy-duty type paving such as Portland cement concrete. By January 1, 1950, a total of more than 66 million square yards of soil-cement had been constructed in the continental United States not only for roads, streets, and light traffic airports, but also in the irrigation field for canal lining, for stabilizing levees and revetments and a variety of other uses.

The Association's research and testing aided in the development of air-entraining portland cement, designed to make concrete pavement and other structures resistant to severe frost action and the action of salts used in thawing ice on pavements. Today, 26 states in areas subject to rapid and numerous cycles of freezing and thawing specify air-entrained concrete for their new pavements. Ten other states have made provisions for its usage, and six are experimenting with it with an eye to adoption.

The Association's research has also helped in the development of pressure grouting to stabilize highway and railway subgrades and tunnels, a process now in use by more than 45 railroads representing 50 percent of America's track mileage.

Some other development projects have included:

—engineering design for concrete pavements;
—analysis of indeterminate stresses developed in reinforced concrete structures;
—methods of concrete house building;
—accoustical properties and heat insulation values of concrete;
—methods of making colored concrete;
—special precast concrete products.

Long-Time Study

A long-time study of cement performance in concrete was started in 1940. This project, sponsored and financed by the members of the Association, seeks to determine factors responsible for differences in cement performance where they are found. Twenty-seven cements were used in the study, representing the full range of physical and chemical properties of commercial cements produced in widely separated sections of the United States. Some 25,000 individual containers were required for the raw material, clinker, and cement samples alone, and a total of 9,000 laboratory specimens and over 4,000 field specimens have been made in this comprehensive study.

Built Test Pavements

The long-time study conforms to a program prepared by a committee of eight outstanding engineers and research scientists outside the cement industry, and four representing the Association. One phase included the building of three test pavements, totaling over six miles of 2-lane concrete highway, located in the states of New York, South Carolina, and Missouri. A second phase included the casting and driving of concrete piles in fresh and salt water.

Other portions of the project include the construction and observation of a thousand concrete beams exposed to alkali soils near Sacramento, California, and of concrete walkway sections and parapet walls atop large dams in the High Sierras of east central California and in the Rocky Mountains of Colorado, where the exposure is unusually severe.

Finally, at two of the field exposure laboratories, one located at Naperville, Illinois, and the other at Perry, Georgia, a study of the effects of exposure on approximately 2,000 concrete specimens in the form of slabs, columns, and boxes filled with wet soil is being carried on.

Continuing Program Important

"If it were not for the continuing program of scientific research and development being carried on by the Association in its laboratories and in the field, applications of portland cement and concrete, commonplace today, would be unknown or prohibitive in cost," the Association declares.

"The expanded facilities for research and development provided by the new laboratories help assure continuing benefits to cement users in the United States and Canada."

Oregon

(*Continued from page* 173)

tions, two 8 x 10 in. photos taken from the best angles, and a sketch or drawing showing the details of constructions and specifications. If the device for which approval is sought has been approved by the Underwriters' Laboratories or other recognized agency, a certified copy of such approval and tests should accompany the application. If requested, the device must be made available for inspection and test.

The Safety Standards Section will do all in its power to handle these applications as quickly as possible. Approval will be based, among other things, on such characteristics as whether positive guarding is provided, whether the guard is designed for the job and the machine, whether it will stand up under normal wear and shock, and whether it constitutes a hazard in itself, etc.

Explains Disapproval

If the safeguarding of the device for which approval is sought fails to meet the safety standards as provided in the codes, a letter setting forth the reasons for refusing to issue the approval and stating the alterations or additions needed to gain acceptance will be sent the applicant.

The code rule requiring guarding by the manufacturer or distributor received the full support and approval of both management and labor representatives at the public hearings held preceding its adoption last year. Design of machines and guards can be done best by the manufacturer and the cost of any necessary guards should be far less than those that the purchaser would be able to build and install.

CMC Members Discuss
Equipment and Product Quality Standards

THE value of standards for equipment purchased by the steel industry and the demand for rising standards of product quality were the principal topics at the semi-annual meeting of the Company Member Conference May 17. The Conference met at Pittsburgh for the first time. This is in line with its policy to visit cities in different parts of the country in at least one, if not more, meetings during each year.

The 40 visiting company representatives from all parts of the Eastern section of the country found Pittsburgh living up to the responsibilities of its "Welcome Week" which began May 18. Thomas D. Jolly, president of the American Standards Association, vice-president of the Aluminum Company of America, welcomed the group. He explained the modernization program that is now going on in Pittsburgh, in which the new U. S. Steel building and the new building of the Aluminum Company of America, are highlights. The Aluminum Company's building, with its outside walls entirely of glass and aluminum, will be an innovation in the building field.

E. W. Gardinor, International Business Machines Corporation, and chairman of the CMC, presided at the first day's sessions.

Using a large chart showing the activities of the American Standards Association, W. P. Kliment, Crane Company, Chicago, gave a graphic presentation of "How ASA Grew and Will Continue to Grow." Every time an important difference has been resolved, the effectiveness of ASA procedure has been demonstrated and the prestige of ASA increased, Mr. Kliment said.

W. J. Donald, managing director, National Electrical Manufacturers Association, described the organization and objectives of the Conference of Executives of Organization Members of the American Standards Association. He said the 100 member organizations had helped to keep standardization activities a free enterprise of industry and had promoted international standardization projects.

Materials for Steel

In one of the principal addresses of the day, I. E. Madsen, standards engineer, Association of Iron and Steel Engineers, explained how his Association operates (page 179). The Association is primarily interested in standards for equipment and materials the steel industry buys, whereas standardization of the industry's products is covered by the American Iron and Steel Institute. The AISE embarked on an extensive program of standardization in 1945. This is carried on largely within the industry, principally because of the severity of service requirements in the steel industry, he explained.

Rejections a Problem

Rising standards of product quality demanded by industrial purchasers and the general public are making rejections and returns a serious problem for producers, Joseph Manuele, director. Headquarters Quality Control Department, Westinghouse Electric Corporation, told the Conference. Rejections are now costing American industry three billion dollars annually, he estimated. Excessive costs of rejections and returns emphasize the value of mutual protection given by clearly defined, understandable, and measurable standards of quality, such as are established by American Standards, he said.

He referred to the standard methods of statistical control of quality for interpreting the normal pattern of variation. Application of these methods would save the American public every year more than it is spending for all electrical household appliances, including radio and television receivers, he declared.

Inspection departments are not enough to cull out sub-quality units. It was pointed out that rejected units, regardless of where they are rejected, have just as much production expense in them as units that meet specifications. Therefore the principle that "quality must be built into a product: it cannot be inspected into it," must be recognized.

(*Continued on page* 183)

Standards engineers Frank Downey, Philip J. Callan, P. L. Houser, and E. W. Gardinor, informally talked with C. L. Rumberger, general manager, Heinz Research and Quality Control Division, about product quality standards.

Standards for the Steel Industry

by I. E. Madsen

Grant Parks (left) of the Irvin Works, Carnegie-Illinois Steel Company, welcomes visiting CMC members, P. L. Houser and Arthur J. Beck, to the plant.

Mr Madsen, Standards Engineer, Association of Iron and Steel Engineers, presented this challenging paper before the Company Member Conference at Pittsburgh, May 17. He tells how engineers in the iron and steel industry develop standards for the equipment and material they purchase and describes the savings that result. Because of the severe service requirements of the steel industry, the items it purchases are not suitable for standardization under a national program, however, he declares. The viewpoint and experience of Mr Madsen's group are of particular interest because of the important role of the iron and steel industry in the country's economy.

"ASA standards" [American Standards] cover only a portion of the field where standardization may be desirable. Unfortunately, when a proposed standard is developed and modified to the point where it meets the consensus requirements of the American Standards Association, the standard has then been modified to the point where it may not fully meet the needs of a specific industry. Many would-be standards are not put into practice because of this fact.

On the other hand, many otherwise desirable standardization projects in the specialty item category are never initiated and carried through to completion because of an immediate recognition that such a standard would never obtain ASA approval. It is this field of standards that will be discussed here.

Severe Requirements

The steel industry in particular is one industry whose requirements are such that the items it must purchase usually do not fit into the national standards picture. One reason for this is that the steel industry's service requirements are very severe. Plants are in operation 24 hours a day, and operations are so scheduled that failure of some items of equipment may cause delay expenses far greater than the amount spent when the industry buys a custom, nonstandard item which will give continuous, uninterrupted service.

Standards for such equipment can be developed in several ways. One common way may be to select and standardize on certain phases of a much broader overall standard such as an American Standard. This may be done when an overall national standard contains items which are satisfactory and suitable for the service required in the steel plant. An example of this type of standard would be the selection of certain sizes and dimensions included in a broader standard, such as the Carbon Brush Standards, ASA C64-1935—"Carbon, Graphite and Metal-Graphite Brushes," and NEMA Carbon, Graphite and Metal Graphite Standards,

Grant Parks shows coil of strip steel to P. L. Houser and Arthur J. Beck.

publication No. 43.85. The first of these, incidentally, is out of date and out of print. Benefits to the steel industry in a project of this sort result from the reduced inventory which the steel industry must carry for spares and replacements. In addition, the savings in quantity discounts which are obtainable in such items as carbon brushes, which go as high as 53 percent, give tremendous incentive to reduce the number of stock items. This practice was initiated by one steel company in this district during the war, and resulted in reduction of its carbon brush replacement cost by a figure of over 40 percent. If such a project is carried through on an industrywide basis, the overall savings would be still greater and other savings to the manufacturer will eventually get back to the consumer.

Oftentimes, the manufacturer is much more anxious to see the standardization carried through than are the steel companies. On the other hand, the manufacturer does not wish to set up production on a new standard item unless he is pretty certain that the large proportion of the plants will purchase such an item. He thus often tries to get prior commitments from the industry that it will purchase the item before he starts production. The industry on the other hand is often reluctant to make any commitments, as it is only natural that it will not purchase a new standard item unless it has a good idea as to what its cost will be in relationship to what the industry is presently purchasing. The manufacturer in turn cannot tell what the cost will be until he knows what the demand will be. The result is a vicious circle.

It is at this point that a neutral standardizing agency can perform a very valuable function. If a body which has adequate representation from the various plants will adopt a satisfactory standard, this is an indication that the industry will go along as far as purchases are concerned, and assures the manufacturer of a reasonable volume.

As a result, the manufacturer often initiates and suggests possible items of standardization, and such action has often resulted in the adoption of some very worthwhile standards.

Suggest Revisions

By the same token, after a standard has been adopted, and later when developments, techniques, and materials have reached a point where the manufacturer of equipment feels that a new standard should be adopted or the old standard revised in order to keep up with progress, he will usually then suggest such revisions.

An example of this latter type has been the constant progress and revisions in the AISE Mill Motor Standards. These motors have been standardized on frame sizes and ratings, as well as mounting dimensions for a number of years.

Since there is a tremendous number of such motors now in use in the industry, one would defeat the purpose of standardization if the new motors were not interchangeable with the old. To overcome this, the method used by the AISE has been to hold back on revising a standard until such time as developments have reached the point where the motors in one frame could be rerated up to the next frame size. For example, in the last revision of the AISE Mill Motor Standard which took place September 1947, the AISE Frame 10, rated 35 hp for the 60 min 75 C rise was rerated to 50 hp, 60 min 75 C rise, and all the other motors in the series were moved one notch correspondingly. As a result, a newer and smaller motor is available but one which can be used interchangeably on existing equipment if necessary.

Another Benefit

As a matter of fact, there is another beneficial effect in using this type of standard revision. The steel industry is typical of most industries in that there is a constant pressure from management to get more and more production out of existing equipment. Such increases often require larger motors, if older units are not to be constantly burning out, and the adoption of a standard in which a higher rated motor can be substituted helps the operator to increase his production, without correspondingly increasing maintenance troubles and delays.

Another factor which initiates the development of standards occurs when operators have difficulty with equipment or when equipment failures cause accidents. In such cases, the men in the industry ask for standards to be developed which will overcome such difficulties. The present AISE project on limit switches is in answer to a demand of this sort.

Up to now most of the discussion has been applicable to all types of industries. The remainder of this paper will concern itself more specifically with the steel industry and with the detailed postwar standardization program which the AISE has and is carrying out.

Goal Was to Serve

Throughout the war, a great deal of standardization was accomplished by the steel industry. These projects were usually directed and carried out for two purposes: first, to save and reduce the amount of critical materials needed in steelmaking; and second to standardize on various types of equipment which were needed by the steel industry, so that the suppliers could increase their production by working on a standardized product. An example of the former was the steels which were developed by the industry to reduce the amount of critical materials required, a project in which the American Iron and Steel Institute and the War Production Board were the chief moving factors. An example of the second was standardization of carbon brush terminals proposed by the Department of Commerce in its simplified practice recommendation R210-45, July 15, 1945, so as to reduce the number of types on the market.

At the close of the war, the AISE resurveyed its standardization program. As a result, the Association of Iron and Steel Engineers decided at a meeting held in September 1945 in Cleveland, Ohio, that it should reembark on a vigorous program of standardization and research activities, and thus continue with some of their prewar work as well as make up for the time lost during the war.

At this point, it might be advisable to explain what the Association of Iron and Steel Engineers is, as this organization is sometimes confused by a few people outside the industry with the American Iron and Steel Institute. The Association of Iron and Steel Engineers is an international professional technical society with headquarters in Pittsburgh and consists of over 4,000 individual members. Those members are men identified with the engineering, operation, and management of the iron and steel and allied industries. The organization, as is typical of practically all professional societies, publishes a monthly magazine called the *Iron and Steel Engineer* as well as an *Annual Proceedings*. This society also holds district and national meetings as well as expositions.

The research and standardization work carried out by the Association of Iron and Steel Engineers is one of the means used by the group to fulfill the purpose of its charter "The advancement of the technical and engineering phases of the production and processing of iron and steel." The group does not concern itself with product standardization, since that field is the primary concern of the American Iron and Steel Institute and is adequately covered by that group. The field or standardization in which the Association of Iron and Steel Engineers is primarily concerned deals with the means and equipment used in the production of iron and steel. The work is done through a research and standardization committee whose chairman for many years was F. W. Cramer, Electrical Engineer, Carnegie - Illinois Steel Corporation. The committee is now headed by L. J. Gould, Chief Engineer, Construction, of the Bethlehem Steel Company. Committee decisions are subject to final ratification by the Association.

The program as set up at the meeting in September 1945 is a typical example of how this work is carried out. Prior to this meeting, a list of suggestions on desirable standardization projects had been collected from the members. Several hundred such suggestions were on the list, a program which was far beyond the capabilities of an organization of our type or probably any organization. These suggestions were culled over and consideration was given at the meeting to those which had been received from the largest number of members. The research and standardization committee in going over these eliminated a large number for various reasons such as the following:

1. The steel industry's interest in this particular item is a minority interest and the work should be done by some other group, such as NEMA for example.
2. A knowledge of present practice in the industry indicated that standardization could not be attained, and no consensus would ever be reached.
3. Developments on some particular items were so rapid that it was not desirable to standardize.
4. Further design and engineering data were required before standardization could become effective.

This latter problem led the Association of Iron and Steel Engineers to sponsor a number of research projects, most of which were carried out in engineering college laboratories to develop data which might be required for a standard.

The resultant program led to a number of projects which fell into two classes of standards, one of

(*Continued on page* 134)

Beck, Parks and Houser, again, this time watching the operation of a machine.

Standards From Other Countries

MEMBERS of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. The titles of the standards are given here in English, but the documents themselves are in the language of the country from which they were received.

For the convenience of our readers, the standards are listed under their general UDC classifications.

001.4 Terminology

The Netherlands

Harbours' Terminology, N 5004

05 Periodicals

The Netherlands

Abbreviation of Titles (Revised), N 782

543.3 Water Analysis

Denmark

Bacteriological Analysis of Drinking Water, DS 265, 2nd edition

France

Tests for Color, Odor and Taste of Water, NF T90-002
Hardness Test of Water, NF T90-003
Test for Fluorine Content in Water, NF T90-004

614.8 Prevention of Accidents

Chile

Signs for Prevention of Industrial Accidents, INDITECNOR 2.681-4

The Netherlands

Specification for Filter for Protective Masks, N 952
Fire Fighting Equipment. Dividing Breeching With Four 2½ inch Connections, N 1466

625.8 Paving of Roads and Highways

The Netherlands

Blast-Furnace Slag for Road Construction. Definition. Testing. N 1100/1

628 Sanitary Technology and Engineering. Sewerage. Heating. Illumination

Denmark

Highway Stationary Lighting, DS F701

Poland

Connections of House Water Line to Street Water Main, PN B1951 through 1956

665 Oils. Fats. Waxes

The Netherlands

Mineral Oils. Distillation Test, N 942
Greases and Related Products. Determination of Ash- and Sulphate-Content, N 1640

Poland

Petroleum Products. Water Content in Fuel Oil, PN C04044
Petroleum Products. Saponification Number Test, PN C04069
Petroleum Products. Ash Content Test, PN C04077
Turbine Oil, PN C96059

Rumania

Petroleum Products. Determination of Sulfur Content, STAS 119
Mineral Oils, STAS 508; 509
Distilled Mineral Oils, Cylinder Oil, STAS 745; 746; 747

Sweden

Determination of Viscosity of Oils and Greases, SIS 15 02 15

667.6/.8 Paints. Varnishes. Lacquer. Polishing Materials

France

Classification of Paints, NF T30-003
White-Lead Pigment, NF T31-005
Minium and Orange Pigment, NF T31-004
Preparation of Small Sheet-Steel Plaques for Use as a Base for Paint Specimen, NF T30-021

India

Methods of Test for Dry Pigments and Extenders for Paints, IS:33
Basic Carbonate of Lead, IS:34
Zinc Oxide, IS:35
Leaded Zinc Oxide, IS:36
Lithopone, IS:37
Antimony Oxide, IS:38
Basic Sulfate of Lead, IS:39
Carbon Black, IS:40
Bone Black, IS:41
Vegetable Black, IS:42
Lamp Black, IS:43
Black Oxide of Iron, IS:44
Manufactured Red Oxide of Iron, IS:45
Natural Red Oxide of Iron, IS:46
Ocher, IS:47
Natural Sienna (Raw and Burnt), IS:48
Natural Umber (Raw and Burnt), IS.49
Lead Chrome and Lead Molybdate, IS:50
Zinc Chrome, IS:51
Cadmium Lithopone, IS:52
Brunswick Green for Paints, IS:53
Green Oxide of Chromium for Paints, IS:54
Ultramarine Blue for Paints, IS:55
Prussian Blue for Paints, IS:56
Red Lead for Paints and Jointing Purposes, IS:57
Litharge for Paints, IS:58
Pigment Dyestuff for Paints, IS:59
Lake Pigments for Paints, IS:60
Slate Powder for Paints, IS:61
Graphite for Paints, IS:62
Whiting for Paints, IS:63
Barytes for Paints, IS:64
Blanc Fixe for Paints, IS:65
Asbestine for Paints, IS:66
Silica for Paints, IS:67
Kaolin for Paints, IS:68

Sweden

Pigments. Determination of Humidity, SIS 16 00 02
Pigments. Determination of Water Soluble Components, SIS 16 00 03
Pigments. Determination of Coarse Particles Content, SIS 16 00 04
Pigments. Determination of Acidity and Alcalinity, SIS 16 00 05

United Kingdom

Colors for Flat Finishes for Wall Decoration, BS 1572:1949
Water Paints and Distempers for Interior Use, BS 1053:1950
Letterpress Process Inks, BS 1480:1949

Uruguay

Titanium Oxide, Pigment, UNIT 46-50

669 Metallurgy

Austria

Structural Steel of General Use, ÖNORM M3112
Case Hardened and Tempered Steel, ÖNORM M3161

Belgium

Letter Symbols for Designation of Different Grades of Steel (Based on ISA Recommendations), NBN 147

France

Fracture Method of Austenitic Grain Size Test and Hardenability Test of Tool Steel, NF A04-302
Physical Tests of Metals, NF A04-303

India

Specification for Phosphor Bronze Ingots and Castings, IS:28
Specification for Aluminum Sheets and Coils for Aircraft Purposes, IS:29
Specification for Aluminum-Coated High-Tensile Aluminum Alloy Sheets and Coils for Aircraft Purposes, IS:30
Specification for Aluminum-Manganese Alloy Sheets and Coils, IS:31

Italy

Special Carbon Steels for Case Hardening. Specification, Tests, Acceptance, UNI 2952-2954
Classification of Special Tool Steels, UNI 2955
Chemical Analysis of Metals: Determination of Tungsten, Cobalt, Titanium, Copper, Silicon, Carbon, Manganese and Molybdenum, UNI 2958 through 2967

Poland

Iron Ore Test for Arsenic Content, PN HO4112
Iron Ore Test for Vanadium Content, PN HO4116
Lead, PN H82201

Rumania

Carbon Steel. Specifications, STAS 500
Seamless Steel Pipes for Structural Use, Types 00, 35, 45, and 55, STAS 507; 517; 518; 519
Bare Copper Wire, STAS 683; 684
Structural Alloy Steel, STAS 791; 792

Sweden

Stainless Steel, Type 23 35, SIS 14 23 35

Union of South Africa

Specifications for High Purity, Zinc, SABS 20-1949; Specifications for Zinc-Base Alloy ingots for die-casting, SABS 25-1949; Specifications for Zinc-Base die castings, SABS 26-1949. These three standards are available in a bound edition.

United Kingdom

Wrought Aluminum and Aluminum Alloys —Tubes, BS 1471:1949

Wrought Aluminum and Aluminum Alloys —Wire, BS 1473-75:1949

Wrought Aluminum and Aluminum Alloys: Bars, Rods and sections, BS 1476:1949

Anodic Oxidation Finishes for Aluminum and Aluminum Alloys, BS 1615:1949

Commentary on British Standard Wrought Steel En Series, BS 971:1950

Mild Steel Castings of High Magnetic Permeability, BS 1617:1950

Cold Drawn Low Carbon Steel Tubes for Heat Exchanges and Condensers for the Petroleum Industry, BS 1627:1950

Cold Drawn Alloy Steel Tubes for Heat Exchanges and Condensers for the Petroleum Industry, BS 1628:1950

Corrosion-Resisting Alloy Steel Castings, BS 1630-32:1950

Steel for Land Boilers, Receivers and Other Pressure Vessels, BS 1633:1950

Heat Resisting Alloy Steel Castings, BS 1648:1950

672 Articles of Iron and Steel

Rumania

Anchor Chain Lever Locking Link, Stud Links, etc, STAS 170 through 172

Sweden

Tins, With Rimmed Lids, CSB 254

Switzerland

Tin Cans and Lids for Preserved Food, Sizes 72, 99, 117 mm in Diameter, SNV 29610 through 29613

674 Wood Industry

Poland

Flooring Material of Various Species of Lumber, PN B94001

Rumania

Wooden Posts for Overhead Electric Lines, STAS 644

Test Methods of Wood, STAS 336; 337; 338

Sweden

Wooden Moldings, SIS 60 00 09

677 Textile Industry

Germany

Fiber Materials. Basic Definitions, DIN 60000

Hackling-Machine Pins and Guides, DIN 64106; 64109

The Netherlands

Determination of the Content of Cellulose Acetate in Textiles, N 1227

Determination of B-Naphtol in Olein, as a Wool Oil, N 1228

Weight Per Square Meter of Fabrics, N 1238

Textile Auxiliary Materials. Mackey Test for Greasy Substances, N 940

Textile Testing. Number of Threads of Woven Fabric, N 1230

Rumania

Woolen Textiles for Clothing, STAS 272 through 276

Cotton Textiles of Various Grades and Names, STAS 321; 322; 344 through 348; 501; 617 through 624

Cotton Thread. Table of Sizes, STAS 287

Specifications for Various Cotton Fabrics, STAS 845; 846; 847

Sweden

Determination of Tensile Strength of Fibers, Yarns and Fabrics, SIS 65 00 07; 65 00 09

69 Building Industry and Trades. Building Construction

Austria

Rules Relative to Carpentry Work, ÖNORM B 2215

Wooden Houses. Quality Specification, ÖNORM B 2320

Denmark

Building Code, Part 2: Concrete and Reinforced Concrete Structures, DS 411

Italy

Window Openings. Dimensions, UNI 2968/9

Stone Window Sills, UNI 2970/1

1, 2, 3, & 4—Section Windows and Balcony Doors With Roll-Up Type Shutters. Summary of Standard Sizes, UNI 2972/3

Details of 1 to 4-Section Windows With Roll-Up Type Shutters, UNI 2974-2977

Details of 1 to 4-Section Balcony Doors With Roll-Up Type Shutters, UNI 2978-2981

1 to 4-Section French Window Frames Dimensions. Nomenclature of Structural Parts, UNI 2982-2985

1 to 4-Section Balcony Door Frames Dimensions. Nomenclature of Structural Parts, UNI 2986-2989

Details of the Recess for Accommodating the Roller Mechanism of Roll-Up Type Shutters, UNI 2990

Various Mouldings for Window and Door Frames, UNI 2991

Types of Joints Window and Door Frames, UNI 2992

Hardware for 1 to 4-Section Windows and Balcony Doors, UNI 2993/4

Rumania

Unit Weights of Building Materials, STAS 502

Solid and Hollow Structural Bricks, STAS 456 through 459

Sweden

Door Joineries. Nomenclature, SIS 60 87 01

Doorcases, SIS 60 87 19

744 Technical Drawings

France

Lettering for Architectural Drawings, NF P02-004

Rumania

Technical Drawing Practice, STAS 103; 104; 187; 188; 282; 415; 613; 614

Sweden

Simplified Method of Representation of Screw Threads and Springs, SMS 683

Simplified Method of Representation of Spur Wheels, etc. SMS 684

CMC Members

(*Continued from page* 178)

Statistical methods also determine producers' ability to live up to desired quality standards. Mr Manuele gave several examples to show how to determine whether specifications are within the possibilities of production with existing equipment and whether equipment purchased from two or more suppliers meets all requirements equally well.

The Heinz Company and the Irvin Works of the Carnegie-Illinois Steel Company were open to the company visitors the second day of the meeting. A visit to the quality control laboratories of the Heinz Company, a talk by C. L. Rumberger, general manager of the Heinz Research and Quality Control Division, and a visit to the research laboratories gave a clear idea of the constant care and study that goes into maintaining a food product the public likes. The chief problem is the appearance of the product, including color; the second is taste; and the third is cost, it was explained. On the first two points a great deal remains to be learned. The Munsell Book of Color provides standard definitions for color which are adapted for judging whether tomato soup, for example, is the correct shade of red.

Taste is a serious problem, solved at the present time by a number of tasting committees. A committee for soup is expert in soup alone; it does not taste pickles, or baby food.

Aroma, another important quality characteristic in food processing, cannot be measured scientifically. Even the committee test is unsatisfactory, since different individuals have different reactions.

The CMC members visited the bottling, labeling (both can and glass), and peanut butter departments, as well as the quality control and research laboratories.

In the afternoon, a visit to the Irvin Works of the Carnegie-Illinois Steel Company gave a view of this plate and sheet works and the various processes, such as hot-rolling, cold-rolling, annealing, and tinplating.

Modular Coordination Program Under Way

MODULAR coordination of building materials and equipment is making a new start, with William Demarest, Jr as Secretary for Modular Coordination on the staff of the American Institute of Architects. This Section on Modular Coordination has been established in the Department of Education and Research of the AIA through the efforts of the American Institute of Architects and the Producers Council, Inc. (sponsors of ASA Committee A62) and with the cooperation of industrial and technical groups. Mr Demarest is serving as secretary of ASA Committee A62.

Technical services may be made available through the Housing and Home Finance Agency, as a result of cooperative arrangements, within the limitations established by the Congress.

Mr Demarest, through contacts with architects, schools of architecture, builders, manufacturers of building materials, and the Housing and Home Finance Agency, will provide a much-needed unifying factor for the further development of modular standards and the more general acceptance and adoption of the principles of modular coordination. He has been employed by the firm of Harrison & Abramovitz, architects of New York, and by Ronald Allwork, architect, also of New York. In Seattle Mr Demarest was employed by Bain, Overturf, and Turner, architects, and later was with the firm of Naramore, Bain, Brady, and Johanson. During the war he served with the Navy.

William Demarest, Jr.

Mr Demarest will serve as coordinator and center of promotion, education, and service in the modular movement.

He will make his headquarters at the offices of the American Institute of Architects, 1741 New York Avenue, N.W., Washington 6, D. C.

Study committees of Committee A62 are already starting to pick up their activities. A joint meeting of Study Committee chairmen is projected for mid July to consider problems of coordination among various types of openings in masonry walls and wooden and metal windows. Study Committee 17 on metal partitions for shower and toilet stalls will soon be ready to propose a standard following coordination of details with work under way in other study committees. Study Committee 16 on Kitchen Equipment has also nearly completed work on a proposed standard giving dimensions and arrangements of kitchen appliances.

Standards for Steel

(*Continued from page* 181)

which in the strict sense may not be a standard at all. In the first class fell such items as Mill Motor Standardization. In this type of standard, the AISE adopted standard mounting and clearance dimensions and ratings with the objective of making mill motors interchangeable. Other AISE projects which fell in this class are:

1. Chains and slings.
2. Size, length, width and breadth, and type of shunting for motor brushes.
3. Machine surface finishes.
4. Dimensions for enclosed switches.
5. Flexible and solid couplings.
6. Wiring diagrams for steel mill control.
7. Mill motor brake standardization.
8. Crane wiring.
9. Crane limit switches.
10. Low voltage a-c current starters.

The other type of standard falls in the design standard classification.

The object of these standards is to insure that a supplier designs a piece of equipment, which meets a definite set of the purchaser's design requirements. The purchaser is also better able to evaluate proposals when equipment is furnished to a definite standard. In this class of standard the AISE has been working on:

1. Design of ladle hooks.
2. Design of hot metal ladles.
3. Determination of data for the design of steel plant air filters.
4. Turbine inspection. (A procedure.)
5. Handbook of lubrication standards for the steel industry.
6. Plain bearings for steel plants.
7. Specifications for design of electric overhead traveling cranes for steel mill service.
8. Steel mill lighting.
9. Rolling pressures and power requirements for rolling mills.

Most of these projects have been carried out by members of the American Institute of Steel Engineers but in some cases they have been handled as cooperative standardization projects with other organizations, usually the National Electrical Manufacturers Association. In a couple of instances, the AISE is merely cooperating with other groups to furnish steel plant data. The steel mill lighting project is an instance of this last type.

A number of the projects enumerated above have been completed and some are still under way. A large number of additional programs are being held in abeyance until conditions are right to carry them out.

One may well ask whether the design standards truly fit in the standardization picture. We feel that these are of vital importance. For example, the AISE Standards for Electric Overhead Traveling Cranes have undergone several revisions since their original adoption in 1910. It had been known for some years that the formulae used by the structural designers for bridges and buildings,

(*Continued on page* 187)

AMERICAN STANDARDS

Status as of June 15, 1950

Legend

Standards Council — Approval by Standards Council is final approval as American Standard; usually requires 4 weeks

Board of Review—Acts for Standards Council, gives final approval as American Standard; usually requires 2 weeks

Correlating Committees — Approve standards to send to Standards Council or Board of Review for final action; approval by correlating committee usually takes 4 weeks

Building

American Standards Just Published—

Specifications for Structural Clay Load-Bearing Wall Tile (ASTM C34-49; ASA A74.1-1950) $.25

Specifications for Structural Clay Floor Tile (ASTM C57-49; ASA A77.1-1950) $.25

Sponsor: American Society for Testing Materials

Drawing Room Practice

In Standards Council—

Abbreviations for Use on Drawings, Z32.13 (Revision of Z32.13-1946)

Sponsors: American Institute of Electrical Engineers; American Society of Mechanical Engineers

Electrical

American Standards Just Approved and Published—

Specifications for Rigid Steel Conduit, Zinc Coated, C80.1-1950 $.50

Specifications for Rigid Steel Conduit, Enameled, C80.2-1950 $.50

Specifications for Electric Metallic Tubing, Zinc Coated, C80.3-1950 $.35

Sponsors: National Electrical Manufacturers Association; American Iron and Steel Institute

Submitted to ASA for Approval

Proposed Addition to American Standard for Attachment Plugs and Receptacles C73-1941 — Grounding-Type Attachment Plug Caps and Receptacles, C73

Sponsor: National Electrical Manufacturers Association

Mechanical

American Standards Just Published—

Twist Drills, Straight Shank and Taper Shank, B5.12-1950 (Revision of B5.12-1940) $.75

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers; National Machine Tool Builders' Association; Metal Cutting Tool Institute

Design for Fine-Pitch Worms and Worm Gears, B6.9-1950 $1.50

Sponsors: American Society of Mechanical Engineers; American Gear Manufacturers Association

Plain Washers, B27.2-1949 $.25

Sponsor: American Society of Mechanical Engineers; Society of Automotive Engineers

Seamless 1-Percent Chromium, 0.5 Percent Molybdenum Alloy-Steel Pipe for Service at High Temperatures, ASTM A 315-48T; ASA B36.25-1950

Seamless and Welded Austenitic Stainless Steel Pipe, ASTM A 312-48T; ASA B36.26-1950 $.25

Welded and Seamless Steel Pipe, ASTM A 53-47; ASA B36.1-1950 $.25

Electric-Resistance-Welded Steel Pipe, ASTM A 135-46; ASA B36.5-1950 $.25

Sponsors: American Society of Mechanical Engineers; American Society for Testing Materials

American Standards Approved—

Lock Washers, B27.1-1950 (Revision of B27.1-1944)

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

In Board of Review—

Seamless Alloy-Steel Pipe for High-Temperature Service (ASTM A158-49T; ASA B36.21)

Sponsor: American Society for Testing Materials

In Correlating Committee—

Recommended Practice for Mechanical Refrigeration Installations on Shipboard, B59

Method of Rating and Testing Refrigerant Expansion Valves, B60

Sponsor: American Society of Refrigerating Engineers

Involute Splines, B5.15

Sponsors: American Society of Mechanical Engineers; National Machine Tool Builders' Association; Metal Cutting Tool Institute; Society of Automotive Engineers

Withdrawal of American Standards Requested—

Outside Dimensions of Plumbago Crucibles for Non-Tilting Furnaces in Non-Ferrous Foundry Practice, H13-1925

Requested by: Crucible Manufacturers Association; American Foundrymen's Society

Motion Picture

American Standards Just Published—

Location and Size of Picture Aperture of 16-mm Motion Picture Cameras, Z22.7-1950 $.35

Location and Size of Picture Aperture of 16-mm Motion Picture Projector, Z22.8-1950 $.35

Location and Size of Picture Aperture of 8-mm Motion Picture Cameras, Z22.19-1950 $.25

Location and Size of Picture Aperture of 8-mm Motion Picture Projectors, Z22.20-1950 $.25

Sponsor: Society of Motion Picture and Television Engineers

American Standards Approved—

Scanning Beam Uniformity Test Film for 16-mm Motion Picture Sound Reproducers (Laboratory Type), Z22.80-1950 (Revision of Z52.7-1944)

Scanning Beam Uniformity Test Film for 16-mm Motion Picture Sound Reproducers (Service Type), Z22.81-1950 (Revision of Z52.7-1944)

Sponsor: Society of Motion Picture and Television Engineers

American Standards Withdrawn—

Method of Determining the Signal-to-Noise Ratio of 16-mm Sound Motion Picture Prints, Z52.38-1944

Method of Determining the Noise Level of Motion Picture Cameras, Z52.60-1945

Withdrawal requested by: Society of Motion Picture and Television Engineers

Photography

American Standards Just Published—

Dimensions for Amateur Roll Film, Backing Paper and Film Spools, Z38.1.7-1950 (Revision of Z38.1.7-1943 through Z38.1.24-1943) $.75

Sponsor: Optical Society of America

In Board of Review—

Procedure for Determining the Safety-Time of Photographic Darkroom Illumination, Z38.8.13

Photographic Filing Envelopes for Storing Processed Photographic Films, Plates, and Papers, Z38.8.21

Dimensions for Lantern Slides, Z38.7.19 (Revision of Z38.7.13-1944)

Sponsor: Optical Society of America

Safety

American Standard Just Approved and Published—

Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways, Z26.1-1950 (Revision of Z26.1-1938; Z26.1a-1948) $1.00

Sponsors: National Bureau of Standards; Accident Prevention Department of the Association of Casualty and Surety Companies

American Standard Approved

Safety Code for Mechanical Refrigeration, B9.1-1950 (Revision of B9-1939)

Sponsor: American Society of Refrigerating Engineers

In Board of Review—

Safety Code for Industrial Power Trucks, B56

Sponsor: American Society of Mechanical Engineers

What's New on American Standard Projects

Building Code Requirements for Fire Protection and Fire Resistance, A51—

Sponsors: National Board of Fire Underwriters; National Fire Protection Association; National Bureau of Standards, U. S. Department of Commerce

An editorial subcommittee has been appointed to prepare a draft of a proposed standard on building code requirements for roofing. The draft will be circulated to the sectional committee for letter ballot vote. Members of the drafting subcommittee are:

N. D. Mitchell, Fire Resistance Section, National Bureau of Standards
A. J. Steiner, Underwriters Laboratories
J. H. Courtney, American Standards Association, Washington

The Subcommittee on Classification of Occupancies has been asked to study the recommendations of the Joint Committee on Unification of Building Codes. These differ somewhat from recommendations made by the subcommittee in a report in 1947. When the subcommittee resubmits its report, it will be sent to letter ballot of the sectional committee.

A report on definitions and classifications of types of construction is to be duplicated and made available to all who are interested. When recommendations of the Joint Committee on Unification of Building Codes become available, the report will be reconsidered.

An eighth draft of a report on height and area limitations is to be considered for acceptance by the sectional committee and may be cleared for circulation to anyone interested. A table comparing the height and area limitations recommended with those of a number of building codes is being prepared.

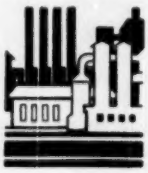
Research is now being carried on which will be used as a basis for the work on interior wall and ceiling finishes. It is sponsored by the National Lumber Manufacturers Association and the Douglas Fir Plywood Association. Other groups may possibly be associated with it later. The research is intended to develop a more rational correlation between the service requirements in use and the ratings resulting from the tunnel test developed by the Underwriters' Laboratories. This test is being recommended to the American Society for Testing Materials for adoption.

Wire and Sheet Metal Gages, B32

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers (Reported by ASME)

Sectional Committee B32 held a reorganization meeting in New York April 25, 1950. I. V. Williams, Bell Telephone Laboratories, Inc, New York, N. Y., was elected chairman. One of the major items on the agenda was the question of developing an American Standard wire gage to replace the many methods of designating wire sizes now in use. When such a proposal was first brought forth before the committee became inactive, it was opposed by the electrical industries which felt that the proposed standard would upset present sizes for electric conductors and would cause general confusion in the industry. This opposition was overcome by an agreement to restrict the standard to wire for mechanical purposes.

As soon as drafts of the proposed standard are available, these will be circulated among interested persons for comment.



Electrical Indicating Instruments, C39

Sponsor: Electrical Standards Committee

Subcommittee 1 has completed work on a revised American Standard for Electrical Indicating Instruments and will submit it to the sectional committee for approval within the next few weeks.

Office Standards, X2

Subcommittee 1 on Office Equipment (Furniture)

Sponsor: The National Office Management Association

At the subcommittee meeting in Cleveland, May 22, a revised draft of the proposed American Standard Reflection Factors for General Office Furniture was considered. In order to acquaint members of the subcommittee with the types of finishes that meet the proposed thirty-five percent reflection factors, test samples will be circulated with the letter ballot. The samples will be of material used for both top and side of desks.

The subcommittee also considered a definition of a posture chair which will be included in the minutes of the meeting. If three weeks after circulation of the minutes no adverse criticism has been received, the definition will be sent out to letter ballot.

A posture chair is defined as "a chair adjustable to fit the stature of the user which shall provide (1) seat adjustable in height, (2) back support adjustable vertically, (3) back support adjustable both forward and back. If the back support is provided with a spring tension, the tension shall also be adjustable. The chair shall be so designed and constructed that when properly adjusted to the occupant it will encourage proper seating posture, thus providing comfort and materially lessening fatigue."

The possibility of standard dimensions for file cabinets was discussed at the meeting, and it was decided to take up the matter with the Steel Section of the Office Equipment Manufacturers Institute. The suggestion would be that the manufacturers of steel files reach agreement on a completely new line of file cabinets which would be made by all manufacturers in standard dimensions. The greatest difficulty at present is the wide range of dimensions for the height and depth of these cabinets.

"Watchdog"

(*Continued from page* 167)

should be reasonably familiar with the provisions of the Constitution, the By-Laws, and the Rules of Procedure of the Association, so that he can carry out his responsibilities in the spirit of those regulations.

I am sure, Mr President, that the importance of this service of the Councilor, both to his own organization and to the standardization movement, must be uppermost in your mind in the presentation of these Awards of Service. Those who have served before have contributed immeasurably to the great growth of the ASA and the national standards program which it typifies. Those who are now serving and will serve in the future will make an equal contribution to the future growth.

No Counterpart

ASA has been spoken of as a unique organization having no counterpart in this country. Likewise, service on the Standards Council is unique. The overall objective is of such constructive importance and value that it should bring to those who participate a feeling of satisfaction as a reward for the time and effort expended, and that, after all, is the best kind of reward. The further recognition of that service by these Awards of Service of ASA intensifies that satisfaction.

Standards for Steel

(*Continued from page* 184)

etc did not apply to crane girders and their use by crane designers was questionable. In 1938, the AISE authorized a research project at the Fritz Engineering Laboratory, Lehigh University, to develop constants, and methods that could be used to calculate these girders. The result is that crane girders can now be designed, with a true picture of the actual service in the calculation.

Another portion of these standards deals with the wheel sizes. Here, again, the service differs from the basic use of wheels on railroads, where high speeds and moderate loadings are normal. On the other hand, in crane service, low speeds and high loadings are required. This standard reduced the wheel sizes from some 650 to about 28 items. In addition, the rail sizes were adopted to correspond with wheel loading and now only five sizes of rails are required.

Various other items such as gearing, coupling, wiring, brake dimensions, etc have also been studied, and as a result of these studies, the steel industry can now purchase cranes suitable for their services from the several builders, that are similar in design and competitive in cost.

It should not be assumed that all standards when carried through will find acceptance or adoption even though it might be theoretically desirable to do so. An example of this is the "Standard Dimensions for Enclosed Switches"—AISE Standard No. 2, which was adopted by the Association of Iron and Steel Engineers in February 1948. This standard has not been put into effect because the steel industry takes such a small percentage of the switch market that the manufacturers have not found it economically justifiable to go into production on this line. This failure has been the only one of its type on the program, and probably demonstrates that this particular program should not have been undertaken.

However, the preceding has been exceptional and the plants which have adopted the other standards have found that they have obtained better equipment as a result of such adoption, and the supplier has obtained a better understanding of what is wanted by the industry. When such desirable results have been accomplished on a plant and company basis, how much more desirable would be the results if the steel companies would work on an overall industry basis.

This is well summarized in a recent communication from one of the larger electrical manufacturers to the AISE asking the Association of Iron and Steel Engineers to study the possibility of standardizing low voltage alternating starters. I will quote, "The second objective is really an appeal for serious consideration by the standards-writing group of the AISE, of the problem of evolving a minimum basic standard for control equipment for the low voltage a-c squirrel cage motor. The eventual outcome can only mean control which is better suited to your industry's needs, with the obvious economic advantages associated with standardization. This suggestion is not without precedent. For example, the D-C Mill Motor Standard (AISE Standard No. 1); the Traveling Crane Specifications (AISE Standard Number 6); the Control Standard for Auxiliary and Accessory Machine Controllers (NEMA Ic13-10); and the pending Standards of Brake Wheel Sizes are all the result of tackling a problem which needed to be solved. It is true that individual practices or preferences may call for variations in any basic standard, but this does not mean that standards are impractical. On the contrary, if there is enough deviation of a related nature, from any basic standard, then the special of today becomes the standard of tomorrow."

We like to think of these specialty engineering standards as "rubber" standards. In some cases they may be eventually stretched out far enough to meet the requirements of a national standard. In other cases they are formed by squeezing down an overall standard. Whichever way the standards develop, they are extremely worthwhile.

Book Reviews

Welding Handbook. 3rd Edition. (American Welding Society, 33 West 39th Street, New York 18, N. Y., 1650 pp, cloth bound, illustrated and indexed, $12.00 per copy in U. S. and Canada, $13.00 elsewhere)

The third edition of the *Welding Handbook* represents over four years of work and the technical assistance of 250 experts who contributed the results of research conducted by their companies in their respective fields.

Intended for use as both a text on welding and as a reference book, the *Handbook* has been aimed at providing the data most needed by the welding industry as ascertained from suggestions received in a nationwide survey of users of the earlier editions.

In addition to containing several American Welding Society standards and numerous references to American Standards and other standards in use by industry, the *Handbook* contains valuable supplementary information to make possible the efficient and economical use of these standards by industry.

The 65 chapters cover the more than 30 welding and cutting processes in use by industry today, the welding of ferrous and nonferrous metals and alloys, and the application of welding in different industries. Also included are individual chapters on cost estimating, welding metallurgy, physics of welding, a dictionary of welding terms, general engineering tables, welding symbols, filler metal specifications, inspection, and many others. A bibliography is included at the end of each chapter listing the important codes, standards, books, and technical articles on the subject of the chapter. More than 300 reference tables are included, as well as a generous number of illustrations showing welding equipment, welding details and specific applications. Both the index and the text are extensively cross-referenced.

Microphones

(*Continued from page* 172)

value to manufacturers and large buyers of hearing aids and earphones in general. The techniques described in it have been used widely in the United States and represent no departure from the best accepted techniques in this country. The couplers

employed are somewhat different from those of England, France, and Switzerland: the principal difference being that the American specification deals with a very simple coupler that may be built in any machine shop while the foreign couplers are more elaborate and require more careful control in manufacture and use. As to suitability of the results obtained, it is believed that the American Standard couplers have been demonstrated to give results correlating as well with real ear measurements as those proposed in other countries. The research underlying the writing of this standard was done primarily in the Bell Telephone Laboratories and the wartime Electro-Acoustic Laboratory at Harvard University.

ISO

(*Continued from page* 174)

ing of Frozen Foods, to the ever controversial and important subject of Aircraft. Technical committees cover very broad fields—Agriculture—and very specific fields—Pallets for Unit Load Method of Materials Handling. Engineers working on the international standardization of Preferred Numbers get off into the realms of philosophy—all in the three official ISO languages, French, English, and Russian.

The United States, through ASA, actively participates in 18 of the 72 ISO projects and is kept informed of the progress of the work in four other technical committees. The projects in which we actively participate are ISO Technical Committees: No. 1, Screw Threads; No. 4, Ball and Roller Bearings; No. 11, Test Pressures for the Acceptance of Stationary Boilers and Unification of Boiler Construction Codes; No. 19, Preferred Numbers; No. 20, Aircraft; No. 22, Automobiles; No. 28, Petroleum Products; No. 36, Cinematography; No. 38, Textiles; No. 42, Photography; No. 43, Acoustics; No. 45, Rubber; No. 50, Shellac; No. 56, Mica; No. 58, Gas Cylinders; No. 61, Plastics; No. 66, Determination of Viscosity; and No. 67, Material for Pipe Lines and Other Fixed Installations in the field of the Petroleum Industry. The U. S. holds the Secretariat for seven of these ISO projects—technical committee no.: 11, 28, 36, 42, 61, 66, and 67. The U. S. has also recently petitioned and has been accepted for active participation in ISO project No. 27, Solid Mineral Fuels (Coal, Coke, etc.).

Scheduled meetings that will bring together international engineering technicians on many of these projects indicate the scope of the ISO work: During July—following the ISO Council meeting in Geneva, an IEC committee on Steam Turbines will meet in London and the ISO committee on Textile Machinery, in Zurich. Between the 10th and the 20th of July, 15 different IEC committees will convene in Paris. During September—The ISO committee on Chemistry will meet for two days in Milan. During October—ISO committees on Gears and Splined Shafts and Hubs will meet in Paris, and the ISO committee on Rubber, in the United States. A five-day committee meeting to work on the international standardization of Automobiles, will also be held during October, in Paris. During November—A three-day meeting on Gas Cylinders will be held in London.

Indeed on an international scale, the ISO not only brings together the leading standardization experts of 28 countries; the ISO also maintains liaison with 35 international agencies and has a liaison officer at the United Nations.

Film Exposure

(*Continued from page* 169)

made necessary careful consideration of the scene factors, and elimination of some conditions under which successful negative film exposure is possible. The committee found it necessary to advise that the exposures recommended for reversal materials are to be considered valid only when the materials are used for projection or viewing, and not for printing purposes. (*Continued in next column*)

A revision and extension of the section dealing with Exposure Indexes has also been made. The American Standard concerning determination of film speeds[2] does not include all the materials now covered by the exposure computer standard. It was therefore necessary to define film speed in such a way as to be certain the Exposure Indexes assigned would result in valid exposures. An Appendix, therefore, lists film Exposure Indexes supplied by the film manufacturers. This list has been supplied for use with the computer and is subject to change if a manufacturer changes his film or manufacturing methods. Therefore it is suggested that users check the data from time to time with the literature of the respective manufacturers. The original War Emergency Standard contained an appendix listing exposure provisions under unusual conditions, and flash-bulb and flood lamp exposure tables. These were omitted from the revision, since it was believed that the data were neither suited in character nor specifically accurate enough for standardization.

Subcommittee 2 decided that the results of this revision should be issued in the format of a regular American Standard. This standard should both provide material for other published exposure computers which are issued from time to time and offer information of direct value in daylight picture taking.

In order to make the benefits of the standard generally available, the American Standards Association has also published the basic information contained in the standard in a handy computer booklet similar to the one issued during the war.

As a part of the international scope of standardization, this information has been made available abroad. It is interesting that the British Standards Institution has considered much of the basic information as worthy to be included in its own computer standard.[3]

[2] American Standard Method of Determining Photographic Speed and Exposure Index, Z38.2.1-1947.

[3] British Standard 935:1948—Photographic Exposure Tables.

News Briefs

• • **Standards in Japan** — Subjects covered in recent editions of the Japanese Standards Committee's magazine indicate the trend of standardization activities in that country: automobile industry, ignition plug, foreign automobiles, ship-building, optical and surveying instruments, drawing standards, motors for spinning and weaving, metals, filing systems, and the bit heat treatment.

American Standard Cuts Down Injuries

Four-inch high flat dolly trucks were the cause of a number of injuries when employees tripped over them in the aisleways, one of ASA's staff men heard in an off-the-record conversation recently. The company's solution was to paint the dollies a bright yellow in accordance with the American Standard Safety Color Code for Marking Industrial Hazards. Result—no more accidents. A premium to the company is the fact that the bright color makes the dolly trucks so conspicuous that employees are impelled to move them to a safer place when they are inadvertently left in the aisleways.

• • **Top management of British industry** is facing a number of serious problems as the result of recent reports recommending adoption of standardization and simplification techniques. (For a discussion of the recommendations, see "Standardization in British Industry," STANDARDIZATION, February, 1950, page 43.) Dr H. E. Merritt, member of the Institution of Mechanical Engineers, discussed these problems in detail at a meeting of the Institution in February.

Standardization and simplification techniques, he told the group of British engineers, call for a new approach to management. Responsibility for high quality of production must be placed not on the judgment of skilled workmen or individualistic craftsmen but on the application of specifications and methods of test worked out carefully by technicians. Planning of new products, product development through laboratory techniques, and careful design and specification of dimensions and tolerances are needed before any company can realize the monetary returns that it should expect from a standardization and simplification program. The mass production of a limited number of popular products may call for important changes in plant layout, as well as in the entire management approach, he declared.

An abridged version of Dr Merritt's paper is published in the February 24 issue of the British magazine, *Engineering*.

• • **Machine tool standards** — Two new and two revised American Standards for machine tools covering punch and die sets for two-post, punch press tools; involute serrations; single-point tools and tool posts; and twist drills, straight shank and taper shank, approved recently, are part of a series of American Standards for small tools and machine tool elements. This series is being developed by a technical committee sponsored by the American Society of Mechanical Engineers; Society of Automotive Engineers; National Machine Tool Builders' Association; and the Metal Cutting Tool Institute under the procedure of the American Standards Association.

The new American Standard on Punch and Die Sets for Two-Post, Punch Press Tools covers the design and dimensions of back-post sets and diagonal-post sets which are in general demand by tool designers, and are used by die makers for the mounting of punch-press tool details. The types and range of sizes have been selected to meet the largest volume of users' needs and may be manufactured on a continuous production basis.

The American Standard on Involute Serrations was prepared to replace the SAE Serrated Shaft Standard. It provides a uniform, easily fabricated set of serrations that can be made by several manufacturing processes. The range of teeth provides diameters both smaller and larger than the old standard, with the result that there is a much greater selection of sizes. In addition, a new table has been inserted containing a list of allowable errors and effective fits.

The revised American Standard on Single-point Tools and Tool Posts contains three new sections on standard types of single-point tools, in addition to standard terminology, definitions, and sizes of tools and tool holders contained in earlier standards. It represents a combination and revision of American Standard for Tool Shanks and Tool Posts for Lathes, Planers, Shapers, Boring Mills, and Turret Lathes, B5.2-1943, and the American Standard Terminology and Definitions for Single-Point Cutting Tools, B5.13-1939.

The revised American Standard for Twist Drills, Straight Shank and Taper Shank, contains four major changes from the 1940 edition. The tolerances set on various features of drills now provide interchangeability of products of different manufacturers in the users' plants. Taper shank drills have been included, and the sequence of diameters of straight drills has been changed to correspond to the actual sizes purchased and used in industry. All three series of number size, letter size, and fraction size drills have corresponding lengths.

• • **Hospital equipment buying** —"Through the standardization work of the American Hospital Association and the testing program conducted by the Hospital Bureau of Standards and Supplies, Inc, buyers are becoming much better informed about the advantages of buying on the basis of standards and test data," declares Dewey H. Palmer, Research Director, Hospital Bureau of Standards and Supplies in the *Journal of Commerce* January 30. "More and more hospitals are insisting, for example," he says,

"that the sheets they purchase meet the standards promulgated by the American Standards Association late in 1948. They know from actual tests that some of their favorite brands are not meeting these standards in every respect."

Hospitals are watching the development of new and better fibers with great interest and anticipation, Mr Palmer declared. "Unlike the past," he explained, "they now have facilities for investigating these new products thoroughly before large expenditures are made. Today more and more emphasis is being given to service life per unit of cost and in no place more than in the purchase and use of textiles."

• • **The National Bureau of Standards** is making available high-purity standard samples of organic sulfur compounds to interested laboratories of the petroleum, chemical, and allied industries. A portion of each compound is set aside to provide standard samples for calibration of analytical instruments and apparatus in research, development, and analytical laboratories.

• • **Although the minimum illumination levels** in schools can be brought in line with the new American Standard Practice for School Lighting, changes will have to be made in the luminaires in order to bring the light into line with the maximum brightness requirements, F. C. Winkler and John J. Neidhart declare in a recent issue of *Illuminating Engineering*. "Today in America our school rooms are being lighted with equipment selected by architects, school officials, utility men, and lighting engineers," the authors explain. "This equipment ranges all the way from luminaires using exposed incandescent or fluorescent lamps to totally indirect luminaires. Obviously, all of this equipment cannot possibly produce optimum illumination for the eyes of young America. One of the reasons advanced for the selection of such diverse equipment has been the lack of suitable general standards to follow. The new American Standard Practice for School Lighting, approved September 20, 1948, establishes not only the required illumination levels but in addition prescribes recommended brightness limits for lighting equipment."

The article in *Illuminating Engineering* is a report of an investigation to determine the effect of the standard on current practice and to find out whether designs now in use comply with the standard. The highly technical analysis shows the effect of the standard on luminaire distribution, efficiency, cost, and application.

Plaster Magazine Asks for American Standard Thickness

Editorial from "Plastering Industries and the Plastering Craft," February 1950.

How thick was the plaster on that last job you did?

If it's less than one-half inch over the face of the lath, you cheated a job and you've put on the market a potential troublemaker.

You have sat in meetings and subscribed to the American Standard specifications, and you'd be the first to cry to the heavens if someone suggested that the specifications be revised to one-quarter inch of plaster, for you know it is dishonest work. Yet you've been a party to it.

It does no good to blame your failure on the architect, the general contractor or the owner. It's your own responsibility to deliver a proper job of plastering, and it's no excuse that they condoned your cheating.

Think it over. And, before you demand an inspector to insist upon honest lathing and plastering, do a little inner-inspection yourself.

• • **A new standard for Cast Brass Solder-Joint Fittings** (B16.18-1950), to be used with copper water tube, has just been approved as American Standard.

It replaces the American Standard Soldered-Joint Fittings (A40.3-1941) which had been developed for use primarily with plumbing equipment. The new edition recognizes the fact that this type of fittings is now being used also for purposes other than plumbing.

Drainage fittings are not covered. For these, a separate standard is being developed.

The new standard covers pressure ratings; abbreviations for end connections; sizes and method of designating openings of reducing fittings; marking; minimum requirements for material; dimensions and tolerances; and tests.

Sponsors are the American Society of Mechanical Engineers; Heating, Piping, and Air Conditioning Contractors National Association, and the Manufacturers Standardization Society of the Valve and Fittings Industry.

Single copies of American Standard B16.18-1950 are available at 75 cents each from the American Society of Mechanical Engineers or from American Standards Association.

• • **Bolts, Nuts, Screws**—Recommendations for British-Canadian-U. S. unification of two series of bolt, nut, and cap screw dimensions are being presented to British, Canadian and U. S. standards groups. Delegates who represented British and Canadian trade and technical societies, industry, and the armed services at a two-day conference in New York City in June are taking the recommendation back to their countries.

The two series being recommended cover bolts, nuts, and cap screws for heavy duty machinery and a selection based in all but one case on present proposed American Standards for either regular or light series.

Sir Anthony Bowlby was leader of the 12-man British delegation and J. G. Morrow, President of the Canadian Standards Association, headed the Canadian delegation of five which met with the ASA Sectional Committee on Bolts, Nuts, and Fasteners. H. W. Robb of the Standards Division of the General Electric Company is chairman of this committee.

The dimensions discussed at the conference were mostly for hexagon-head bolts and nuts for which the threads are already unified. The range of sizes agreed upon is intended to achieve greater simplification, explained the American Society of Mechanical Engineers, co-sponsor for ASA Sectional Committee B18, and which was in general charge of the meetings. "All of the enormous benefits of interchangeability deriving from the unification of screw threads which these three countries accomplished almost two years ago would be intensified if the recommended series are adopted by Britain and Canada," the ASME declared following the meeting. "The belief in informed circles is that they will."

The conference was the outcome of a British technical proposal sent here in October 1949, to which the Americans replied two months later. It was then decided that the remaining differences in the standards of the three countries could best be discussed at a conference table. Because of present differences in the size ranges of heads of American and British bolts and nuts (for which the threads are already unified) clearances for wrenching are not identical in the three countries. Bolts and nuts on American military equipment and industrial goods cannot be replaced with English nuts and bolts.

• • **ASA Procedure**—An important change in procedure was voted by the Standards Council at its meeting May 19 when the Board of Examination was voted out of existence. Frank Thornton, representative of the National Electrical Manufacturers Association, chairman of the Board, made the motion that ended its existence. It is being replaced by a number of correlating committees, among them the new Photographic Standards Correlating Committee and the Miscellaneous Projects Correlating Committee.

The accomplishments of the committee were applauded by the Council. As expressed by T. E. Veltfort, Copper and Brass Research Association, "It is significant that two new correlating committees are needed to handle the great variety of projects that have come before the Board of Examination, plus a general one to be a catch-all. This committee has had an especially difficult job, since it has not been able to specialize in any one field."

• • **The Building Code Correlating Committee** has expanded its name at the same time that it has increased the scope of its activities. The committee now has under its supervision all the American Standards on building materials and construction, as well as building code standards. It is expected that this will help to bring about greater correlation among standards relating to building codes. Name of the reorganized committee will be the Building Code and Construction Standards Correlating Committee. The American Society for Testing Materials and the Producers Council are each being invited to appoint one additional representative and alternate.

• • **Safety Education**—Henry Lamb, ASA Safety Engineer, had an active part in the workshop on safety education scheduled for Maryland University June 14-17, 1950. This workshop planned a program for the National Conference on Safety Education by Colleges and Universities to be held in Cincinnati, Ohio November 19, 20, and 21. The Conference is being sponsored by the National Commission on Safety Education of the National Education Association.

• • **E. W. Gardinor,** chairman of the ASA's Company Member Conference, is now manager of the Engineering Laboratory of the International Business Machines in Endicott, N. Y. Mr Gardinor had been IBM development engineer since September 1949, and before that was customer and production engineer. He succeeds W. W. McDowell, promoted to head all IBM engineering.

A special bouquet of standard red roses to Ruth E. Mason, STANDARDIZATION's capable, determined, yet entirely-human editor for whom the July 1950 issue marked 20 years in the ASA swivel chair blue-penciling editorial copy. For most of those 20 years she has been editor-in-chief of the ASA publication and has directed its growth from a non-illustrated house organ into the full-fledged 32 page industry-wide letterpress edition you hold—the ASA staff.

Thirty-Second ASA Annual Meeting

and

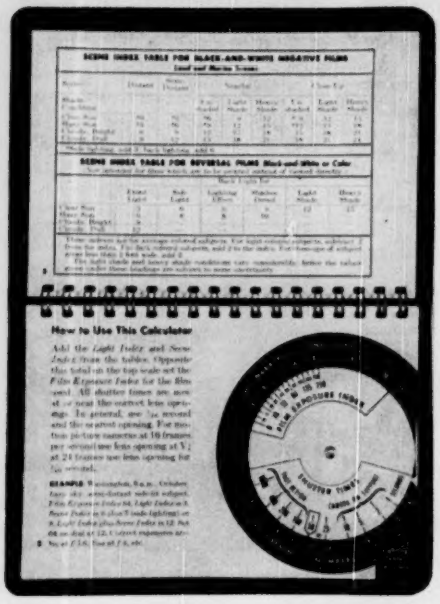
First National Standardization Conference

November 27, 28, 29

Waldorf-Astoria, New York

Lowell B. Mason, Federal Trade Commission, will give the Annual Meeting Luncheon address November 29. Detailed program to be announced.

NOW—True pictures every time—in Color or Black and White



New ASA

EXPOSURE COMPUTER

Here's how it works!

Light index tables give *one* index based on month, day, time, latitude. *Scene index tables* give you another index based on shade condition, distance, type of lighting, type of subject. You just add these two indexes and the calculator translates them instantly into the proper shutter time and lens opening for the kind of film you are using.

only $1.00

The new American Standard Exposure Computer figures for you the variables involved in good picture taking—weather . . . distance . . . time of year. . . time of day . . . clouds and shade . . . *even latitude.* You simply *dial* to get accurate shutter time and lens opening to take sharp, clear pictures under all daylight conditions.

Up-to-the-minute edition!

The new American Standard Exposure Computer is a co-operative achievement of the top experts of the whole photographic industry. It gives you, in quickly useable form, results of a vast amount of research on film speeds and related subjects. This new edition is an up-to-the-minute revision of the Exposure Guide developed in 1942 which was standard equipment for the Army, Navy, and Air Force.

ORDER YOURS NOW!

Put new photographic skill right in your vest pocket with the new American Standard Exposure Computer. It's only 3¼ x 4¾, has 25 pages, opens flat. It's printed on durable, washable cardboard and includes the computer dial. Use the convenient coupon to order yours now.

American Standards Association, Inc.
70 East 45th Street
New York 17, New York

Gentlemen:

Please send me .... of the new American Standard Exposure Computers, Z38.2.2-1949, at $1.00 each.

I enclose $.....

Name .....

Address .....

City..... Zone..... State.....